American BEE JOURNAL

VOL. 92, NO. 8

AUGUST, 1952

Part 2

POLLINATION ROUND-UP

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Food for Thought

1952 -- A Year of Decision for Beekeepers

One of the industry's best friends points out wisely that 1952 can well be a "year of decision" for beekeepers. He asks: "Do beekeepers want a Government price support program for honey and will they help make it work? Do they want a honey sales promotional program—which will cost them relatively little compared with a program financed by the beekeepers themselves—and will they cooperate in making such a program a success? Will there be ample quantities of high quality honey on the grocers' shelves in various parts of the country during National Honey Week, before and afterwards? Or will producers hold their honey so that only limited quantities are available when a substantial consumer demand has been created?"

Honey producers should take full advantage of the new support program. Price support is for the producer; its purpose is to maintain a profitable beekeeping enterprise because of the importance of honey bees to our agricultural economy through their pollination services. But nothing will be more tragic to beekeeping than producers holding their honey when a large consumer demand has been created. The decision of foresight and wisdom will be to move honey through normal channels of marketing in an orderly fashion.

Will honey producers cooperate in making the honey promotional program a success? WE CAN, WE MUST, WE WILL!!!

Industry representatives have worked for several years to obtain this program. One producer made five trips in one week across Loveland Pass to attend PMA meetings; another attended a similar meeting with a sore finger and with a cold so bad he could hardly talk; and a trip to Washington was involved.

The honey industry has a threefold responsibility: (1) It must cooperate fully with the promotional program with every means available; (2) it must create a distribution and sales program at the time of the promotional program during October, before and afterwards; and (3) it must create a continuing program of honey promotion and sales that will prevent stagnation of markets and price fluctuations that have been too common in the past.

This year can well be the turning point for the honey industry if everyone does his or her part. It is our "golden opportunity!" We have the choice either of making a great success of the October promotional program or holding honey for government purchase in what may well be a fiasco as bad and as full of stench as the potato deal.

What will be the decision of the industry? **The decision must be to get to work now and together put our house in order, building wisely for a sound and profitable future.**

Cleanliness Is Next to Godliness

This old adage was quoted to us by a correspondent who urged that honey producers be alerted to the fact that the responsibility of storing and of delivering good honey to the Government under the 1952 support program rests solely with the producer. This responsibility may extend from the time the honey is removed from the colonies, extracted, stored until **May 31, 1953,** and delivered to some designated delivery point. This responsibility is real—it will be up to the producer to fulfill these requirements.

The honey must be of Grade C or better packed in clean, sound, transportable containers. Grade C means that the honey has a maximum moisture content of 20.0 per cent (18.6 maximum moisture content may be required in some areas), possesses a fairly good flavor for the predominant floral source, is fairly free from defects, and is of such quality with respect to clarity as to score not less than 70 points.

Fairly good flavor means that the honey has a fairly good flavor for the predominant floral source or blend of sources, and is free from objectionable flavor caused by fermentation, smoke, chemicals or other causes. Fairly free from defects means honey at least as free from defects as that strained through a No. 18 sieve (23 meshes per inch). Fairly clear means that the honey may be materially but not seriously affected by the presence of air bubbles, pollen grains, or other finely divided particles.

These "definitions" give the producer something to go by. But the honey producer should be warned that someone else is going to do the inspecting, and "that someone else" has the final say as to whether you have handled, processed and stored your honey so that it meets all of these requirements when delivered.

A word to the wise is sufficient, 'tis said. Be wise by being careful and clean! You are processing a food product. It is Nature's finest sweet. Do everything you can to keep it so.

Cityward Movement

In the last decade, farm population has dropped 22 per cent, according to the January news bulletin of The Mutual Life Insurance Company of New York. The migration has left almost half of the countries 3,000 counties with population losses, while urban population has jumped 64 per cent in the period.

This makes one wonder how many beekeepers are now city folks and how many still live on the farm. In the early years of the century most commercial beekeepers lived in the country. Lately, the commercial men moved cityward to avail themselves of water, lights, and other facilities. Have we reached an irreducible limit here, and with R.E.A. and other city facilities available right on the farm, will we now have a trek back to the country for reasons of lower taxes and more freedom of action?

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THE AMERICAN BEE JOURNAL

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Pollination Round-up

Part 2

Both Sides Need to Know Pollination Details

by S. W. Edgecombe

Head, Department of Horticulture
Utah State Agricultural College
Logan, Utah

BOTH farmers and beekeepers need to know the main facts about pollination. Beekeepers should have clearly in mind the details of the pollination requirements of the crop, the placement of bees in or near the field, when to place them there and when to remove them, the colony strength necessary for satisfactory pollination and many other similar beekeeping details. The farmer does not need to know the facts about bees, but he does need to know the pollination requirements of the crop and the effect of cultural practices on the crop.

Orchard pollination well illustrates the need for thorough knowledge on the part of the beekeeper and the orchardist. Occasionally, beekeepers place bees in sweet cherry orchards and the set of fruit is not good, even though the colonies were strong and the correct number of bees were used. There are a number of reasons other than bee pollination activities that enter into sweet cherry fruit set.

The first thing a beekeeper should know is the number of pollinator cherry trees there are in the orchard and where they are located. The commercial sweet cherry varieties, Bing, Lambert, and Napoleon, are all self-sterile and intersterile. They will not set a crop unless there is pollen available from a variety such as Black Tartarian, Windsor or Van. These pollinator trees must be scattered throughout the orchard so that none of the Bing, Lambert or Napoleon trees are more than two trees away from a pollinator variety of tree. In years when pollination weather is ideal (that is, suitable for good honey-bee flight) a smaller than recommended number of pollinator trees may enable the orchardist to get a crop, but in years when the weather during pollination time is too windy, too cool, or too rainy for bee flight, a smaller than recommended number of pollinator trees usually results in poor sets of fruit except near the pollinator trees.

Another factor in fruit pollination is the weather before and after pollination time. Fruit buds may be injured before they open by low winter or spring temperatures. The pistil of the fruit flowers is the part that is most susceptible to the effects of low temperature. Sometimes, there will be a high percentage of pistils that are black before the flowers open. These flowers are useless as they will not set fruit no matter how many bees may be in the orchard.

Also, sometimes the weather is so cold after pollination or during most of the pollination period that the fruit crop fails to set properly even when bees have been correctly handled. After the pollen germinates on the surface of the style it requires a certain temperature (that needed for bees to have a good flight) to grow down the style to the ovary and fertilize the flower. If the temperature is below the proper one, the tube grows very slowly or not at all. Along with this slow growth of the pollen tube is the fact that if the flower is not fertilized within a limited time, a layer of tissue known as the absciss layer forms across the stem of the flower which causes the flower to drop off. The dropping of fruit flowers is often rather baffling to orchardists and beekeepers who know that they have had plenty of bees and that the trees had a good bloom and were in a desirable growth condition.

The above example illustrated the need for a knowledge of all the facts in every crop for which the beekeeper sells pollination service. Far too frequently, the grower does not know all the pollination requirements of the crop he is growing and when that is true the only protection the beekeeper has is to know the facts about the crop and take pains to make the grower aware of them.

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The Present Status of the Dangers of Pesticides to Beekeeping

by Dr. J. E. Eckert

Division of Entomology and Parisitology

University of California
Davis, California

CHANGING agricultural conditions, including cultural methods, rotation of crops, types of crops, and pesticide applications frequently change the potential value of a beekeeping location within a matter of days and only a close association with the farmers, farming organizations, farm advisers, and agricultural commissioners can give the beekeeper a forewarning of things to come. Not all changes, of course, are bad, but good or bad, an advance knowledge of cultural and pesticide programs of crops in the flight area in which an apiary is located may mean the difference between success or failure in beekeeping. There is nothing more discouraging to a beekeeper than to have all potential returns from his labor or from his colonies wiped out with a single application of some pesticide, particularly when there is little likelihood of recovering the loss except through costly and time-consuming court action.

Not so long ago the farmer had but few chemicals to use in the control of his weeds, insects, and fungus diseases. He used lime sulphur, various arsenical compounds, Bordeaux mixture, Black-Leaf 40, cryolite, pyrethrum, and a few other compounds. He rotated his crops and cultivated and burned to control the weeds. Fence rows, ditch banks, and roadsides frequently were overgrown with weeds or brush which provided food and shelter for solitary bees, birds and small game animals. (The weedy fence rows and ditches also harbored injurious insects and destructive rodents.) Orchards and fields have increased in size with mechanized farming, wild bees are disappearing, and injurious insects have increased.

During World War II new chemicals came into use, particularly DDT and its derivatives, and at the present time the grower can choose from dozens of different chemicals for the control of specific weeds, insects, or fungus diseases. The codling moth of apples, pears, and walnuts developed a resistance to arsenicals so that as many as eight or more sprays had to be applied in order to effect economic control. One or two applications of DDT did the work of several applications of lead arsenic. It was soon found, however, that while DDT controlled certain insects it also killed sufficient predators and parasites to enable other insects to cause major crop injury, necessitating the application of additional control measures. This ability of different insects to develop resistance to various poisons has been repeated with many chemicals, especially with some of the newer compounds. Several of the more recently perfected chemicals are so selective for certain insects that additional applications of other materials have to be made, or combinations of chemicals have to be used to give economic control.

DN compounds have been used as thinners on fruit blossoms for the purpose of cutting down the labor of thinning and to make the trees yield more uniformly year after year. Defoliants are used to hasten or to improve harvesting conditions.

Weedicides are used to control weeds and brush and the chemical known as 2,4-D is used widely to control weeds in pastures, rice fields, waste places, and in row crops. Unfortunately for the growers, but fortunately for the beekeeping industry, this chemical is very destructive to many cultivated crops and has caused heavy damage to tomatoes, cotton, orchard trees, legumes, melons, etc. when allowed to drift from fields to which it was applied. It is not highly toxic to bees but has reduced much of the bee forage in pasture and grain fields, along highways, ditch banks, etc. But it has benefited the industry by causing all growers to be alert to the probable damage that can be done by drifting chemicals.

How does the honey bee and the beekeeping industry fit into this chemical warfare on crop pests? One of the first considerations is that a majority of our economic crops are either dependent on cross-pollination to be fruitful or are benefited by the transfer of pollen from one plant to another of the same species. Chemical poisons, while essential to the control of many plant pests, seldom result in eradicating any pest. In spite of the hundreds of thousands of tons of chemicals applied annually to soils and to plants in the United States one can count on the fingers of one hand (with the little finger and thumb missing) the number of pests that have been entirely eradicated by chemical means. Consequently, it is safe to assume that the chemical warfare against crop

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Pollination in New Jersey

by Milton H. Stricker
Armandale, New Jersey

AT the present time all over the country more people are renting bees for pollination than ever before. This is especially true in New Jersey, a state where farmers have long been pollination conscious. Even in the depression 30's, farmers invested from five to seven dollars per colony for the services of the bees.

Today the price goes to as high as twelve dollars per colony and crop reports show that about eighty thousand dollars was spent for bee rentals in '51. This figure, though low in these "take a billion lightly" years, is rather high for such a small state. How much higher it would be if we could estimate the value of those free pollination services unknowingly provided by the many hobbyists in the state.

Being a state of small farms and densely populated, many crops are served free by the bees of the neighboring hobbyist. If this leakage could be controlled, the pollination "take" of the beekeepers in this state would rank with the million dollar grosses of New Jersey's two specialized crops, blueberries and cranberries. The cooperative marketing of these two crops has caused an increase in new acreage, and also an intensive production program for each crop.

There is no adequate way of estimating the extent of the cultivated blueberry plantations. However, an airplane trip over the hithertofore unprofitable "pine barrens" shows that several thousand acres will soon come into bearing. At the current rate of one to two colonies per acre, the demand for bees in two years' time will far exceed the supply.

Examining the apiaries of those people in the state who are now engaged in supplying bees for pollination rental, shows that if they increased their bees two hundred per cent, they would still be unable to cope with the prospective customers who will appear in two or three years when their blueberries begin to bear.

Of course, some hobbyists will move into this inviting field, and there may be new commercialists entering the field, but the cost of equipment and package bees, plus their express charges, is somewhat prohibitive, and buying up bees that are for sale, located in the state, is a slow way of getting started because of the few colonies placed on the market each year.

The cranberry industry is once again about to enter prosperous years and more bees will be needed. There is some additional acreage, but it is small, since the investment is high, and these lands will not come into bearing for eight or ten years. However, work done by Mr. Robert S. Filmer, of the New Jersey Experiment Station, in the past three years shows definitely that bees are a decided benefit to cranberry bogs. Though the results of Mr. Filmer's experiments have not yet been published, most of the New Jersey growers have knowledge of them. This will result in increased markets for the pollination salesman.

At the present time, the New Jersey Experiment Station is investigating the pollination of lima beans. If those experiments should show definite results with bees (and so far it looks good for the beekeeper), there will be a demand for more bees to provide for the pollination

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Pollen supplement for spring pickup.

Yard confined to single story colonies.

Colonies screened and ready to "go."

Unloading on a pollination location.

Variations in Nectar and Pollen Sources Affect Bee Activity

by George H. Vansell

Bureau of Entomology and Plant Quarantine
Agricultural Research Administration
U. S. Department of Agriculture[1]

HONEY bees are often numerous on one plant species and almost absent from an adjacent one. Their activity on blossoms of various kinds is affected by a number of factors, one of which is the sweetness of the nectar. This sweetness is a matter of the total amount of sugars. At least three kinds of sugar—sucrose, levulose, and dextrose—are found in variable proportions. An example of variation in sugar in fresh nectar is as follows: Acala cotton floral nectar had 0.7 per cent of sucrose, 14.3 per cent of levulose, and 13.1 per cent of dextrose, while 15.3 per cent of the total sugar in nectar from Valencia orange was sucrose.

The different species of fruits compete for bee visitation on the basis of attractiveness. The presence of non-fruit species of plants is also a factor. One outstanding example is seen in the foothills of the Sierra Nevada where a flowering cover crop, mustard, draws the nectar bees away from plum and pear trees. Another case of competition occurs in the pear district of southern Oregon, where the big-leaf maple trees frequently hum with bees when only a few can be seen on the orchard blossoms. At the same time almost no honey bees are visiting the madrone tree with its myriad juglike flowers containing low-sugar nectar. Under the humid conditions of western Oregon that prevail in the spring, it is doubtful that the nectar of madrone ever becomes very attractive.

1. In cooperation with the University of California.

The average sugar-concentration values found in the nectars of several fruit and a few other species are present in Table 1. Note that all three mustards have nectar rich in sugar. It is to be expected that a bee would select such in preference to a nectar as low in sugar as Bartlett pear, for example.

One of the best known illustrations of competition between families of plants is between orange and mustard nectars in southern California. Orange nectar evidently is secreted with about 16 per cent of total sugar. The newly opening buds have nectar of this sugar value, whereas newly secreted nectar of mustard (Brassica campestris, L.) is nearer 50 per cent sugar The honey bees definitely prefer mustard nectar and work it almost to the exclusion of other sources in the morning. Also, unless the air is dry enough to cause evaporation of water from the abundant orange nectar, the bees seek the tiny droplets of mustard nectar throughout the day. However, whenever an occasional dry east wind pushes the coastal fog back over the ocean and evaporates the orange nectar to around 26 per cent of total sugar, the honey bees collect it actively. Samples with 40 per cent have been collected by hand from the orange blossoms late on such a

(Please turn to next page)

Table 1.—Sugar concentrations in the nectars of a few California and Oregon plants, arranged in order of decreasing sugar[1]

Plant	Per cent sugar
Common mustard	60
Sweet cherry	55
Big-leaf maple	52
Apple	50
Rape mustard	50
Jim Hill mustard	44
Evergreen blackberry	36
Peach and nectarine	30
Himalaya blackberry	27
Navel and Valencia orange	25
Sour cherry	20
Apricot	15
Madrona	15
Pear	12
Plum[2]	10–60

1. The determinations were made by refractometer method using either hand-collected or bee-collected samples. Any errors due to temperature variation were not calculated out.

2. Many varieties growing under widely different conditions.

day. Bees then are numerous on the orange blossoms and scarce on the mustard blossoms. It is during such a time that the large daily gains in hive weight are seen. On such a day in April 1940 a gain of 22 pounds per colony was reported at Orange, California.

A clear-cut case of honey bees' selective action to sugar concentration in the nectars is seen among the deciduous fruits. In general, bees prefer sweet cherry and apple to the other fruit species in flower at the same time. At times very few nectar bees visit apricots, peaches, or pears, while they are numerous on the apple and sweet cherry. Near Corvallis, Oregon, the sweet cherry trees were humming with bees but only an occasional scout bee was seen on the sour cherry blossoms in the same orchard. The reason for choice between the sweet cherries and the sour cherry varieties belonging to the same genus is seen in the nectar data for these two fruits in Table 1.

A problem has existed in securing commercial sets of fruit in numerous plum varieties. It has undoubtedly been due in part to the incompatibility of pollens, but we now know there is a wide difference in the nectar secretion and its sugar concentration. Eight varieties in blossom side by side at Davis showed a range in sugar concentration from 10 to 28 per cent. Three other varieties, including Kelsey, had no collectible nectar or bee visitors at the time. The Kelsey, a superb late-season variety, is a notably shy bearer.

Up to the present time little if any attention has been given to the quantity or quality of nectar produced by a new variety. Nectar production may well be an important factor in securing adequate insect visitation and set of fruit.

As with nectar, the pollen sources present in an area also give rise to selective activity for pollen. In some plants, such as alfalfa, the presence or absence of pollen collectors is important in pollination because such bees trip about seven blossoms per minute. Two locations studied in California show a great difference in pollen-collecting activity by honey bees. In the lower Sacramento Valley only one bee, or even less, in 300 visitors may be seen collecting pollen in midsummer. On the other hand, in the upper San Joaquin Valley in July 1951, 25 out of 100 bees observed in some fields were collecting pollen. A further evidence of difference in activity comes from trapped pollen samples. The samples from colonies in an alfalfa field at Davis had only a trace of alfalfa pollen, while the pollen from Mettler contained 75 per cent. Puncturevine was the next important source at Mettler and yielded 16 per cent of the total supply. The pollen at Davis was largely from four plants —yellow star-thistle, morning glory, bird's-foot trefoil, and clover.

For further information, see "Nectar and Pollen Plants of California," California Agricultural Experiment Station Bulletin 517; "Nectar and Pollen Plants of Oregon," Oregon State College Bulletin 412; "Use of Honey Bees in Alfalfa Seed Production" and "Factors Affecting the Usefulness of Honey Bees in Pollination," U. S. Department of Agriculture Circulars 876 and 650, respectively.

The Use of Honey Bees in the Production of Cucurbits in Florida

by F. A. Robinson

Assistant Apiculturist
Florida Experiment Stations
Gainesville, Florida

AMONG the more important vegetables now being grown in Florida are cucumbers, squash, and watermelons. In 1951 there were approximately 90,000 acres devoted to the production of these crops and the cash value of the harvest from these crops was over 18 million dollars. In the ten-year period between 1939 and 1949, the acreage planted to these crops more than doubled and is increasing each year.

Along with the increased acreage planted to these crops has come an increase in the problem connected with their production. One of the most important of these problems is that of obtaining adequate pollination in the large fields. All of these plants are monoecious; that is, they produce both male and female flowers on the same plant. However, the male and female organs are born in separate flowers. This fact along with the fact that the stamens, which are the pollen producing organs, are located deep within the throat of the flower, makes these plants almost entirely dependent on insects for pollination.

There is still another factor which affects the pollination of these crops

and that is the relatively short period of time during which the female blooms are open and receptive and the male flowers are open and the pollen mature and capable of fertilizing the female flower. If no insects are present to accomplish the transfer of pollen during this receptive period, little or no fruit will be set and the yields will be greatly reduced. One can easily see that it is vital that the grower of cucumbers, watermelons, or squash be assured of a plentiful supply of pollinating insects in the fields.

Years ago the grower was not aware of any problem insofar as pollination was concerned, but wild pollinators have been so greatly reduced in numbers in the last few years that they are no longer sufficient to assure adequate pollination of large fields. This reduction in the numbers of pollinating insects has been brought about by several causes, the most important of which is the cultivation practices which are followed in growing these crops. For example, the growing of watermelons successfully requires the use of new land each year because of fusarium wilt, a fungous disease, which grows in the soil. The average grower of watermelons in Florida clears a field, plants one crop of watermelons and lets the land lie idle for eight to ten years. In clearing the land, the nesting sites of bumble bees and other wild bees are destroyed and the population of these insects reduced until their numbers are no longer sufficient to assure adequate pollination of the melon crops.

There is another practice which has tended to reduce the numbers of wild pollinating insects and that is the large scale use of insecticides. In trying to control insect pests attacking their crops the growers have unwittingly destroyed large numbers of the beneficial insects as well. So the growers are more and more turning to the use of honey bees to assure adequate pollination of these crops.

Honey bees are especially valuable as pollinators since they are more or less under man's control and their numbers can be increased or decreased simply by moving colonies into or out of the fields. Then, too, the honey bee has the trait of sticking to one crop. If a bee visits a cucumber or squash flower once, then it will continue to work those flowers as long as they remain open or until the nectar flow ceases.

While some growers are fortunate enough to have apiaries located near their fields and thus are assured of adequate numbers of bees; others must contact some beekeeper and make arrangements for him to supply bees for pollination. This practice is becoming more frequent each year and there are several questions which have arisen that should be discussed. First of all, there is the question of payment to the beekeeper.

Some growers felt that the beekeeper should be willing to place bees in his fields and receive no payment other than the honey the bees might produce. Most of the growers soon found that this was not sufficient inducement since in most instances the colonies of bees not only failed to produce any surplus honey, but usually lost weight while working in the cucumber, squash, or watermelon fields. At the present time the beekeeper usually demands a cash payment as rent for his bees. Usually this rental fee is about $5.00 per colony. Generally this cash rental has proved satisfactory to both parties but some beekeepers feel that five or ten dollars is not sufficient payment and they have tried to work out agreements whereby they will share in the increased crop production. As yet, this idea hasn't been accepted by the growers and cash payment is still the most common method of settlement.

In addition to payment for the bees there are several other agreements which should be made, such as the location of the colonies in the fields, and the use of insecticides while the bees are in the fields. Some growers want the colonies placed singly throughout their fields. Since this practice greatly increases the labor and time spent by the beekeeper, and consequently his expense in locating and checking his colonies, he should try to reach an agreement whereby the colonies may be placed in groups in as few locations as possible, and still have all parts of the fields within easy flight range of the bees. Tests have shown that placing the colonies in this manner gives as good pollination results as when they are placed singly.

The other question, regarding the use of insecticides, is probably the most important point of all. Each year a few colonies are killed simply because insecticides are applied without regard to the safety of the honey bees. Since cucumbers, squash, and watermelons, like all other crops, are subject to attack by several insect pests, everyone should realize that insecticides will probably have to be applied while the bees are still in the fields. The insecticides most widely used on cucurbits are parathion, lindane, and TEPP. All of these materials are extremely toxic to honey bees as well as to the harmful insects. In spite of their extreme toxicity, these materials can be applied to

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Several bees working on a female squash bloom.

cucumbers, squash or watermelons during the bloom with little or no danger to honey bees. The blossoms of these crops open in the early morning and all are closed by early afternoon, and the next day new flowers open. One can rarely find honey bees in the fields by mid-afternoon. Knowing this trait of the cucurbits the grower can arrange to make all insecticide applications in the late afternoon when bees are not working in the fields. Then the flowers that are visited by bees the following day, being freshly opened, will not contain any insecticidal residue. By timing the insecticide applications in this manner they can be applied with no danger to the honey bees.

This point regarding the timing of insecticide applications on cucurbits is stressed in all recommendations made by the Florida Agricultural Experiment Station, and when followed provides adequate safety for the honey bees.

Pollination Contracts

by Troy H. Nance
Sacramento, California

IT is often said, "There is a loophole in every contract; and a contract, no matter how binding it may seem, is no better than the parties who make it." However, in my years of pollination work, I have found that much time is saved and much worry and misunderstandings are averted when there is a written contract executed by both parties.

My experience proves the more simple and short the contract, the better. Seed growers, like beekeepers, don't like long, drawn-out, complicated legal terms. Many times they cannot get together on a good deal because the contract they are trying to enter into has too much legal jargon in it, and they both eventually are confused and back out of the project.

The following is a form of a simple contract I have used for a number of years without losing one cent in pollination fees or suffering serious loss from poison sprays:

Contract

Mr. John Doe, beekeeper of Beeville, California, and Mr. Richard Roe, seed producer of Cloverland, California, do consent and agree:

That said beekeeper shall locate 300 hives of bees as designated by said seed grower for the purpose of pollinating clover for seed. Said bees to remain as located until released by said seed grower at the end of the useful pollination period.

Said beekeeper reserves the right to remove the bees to a safe place for a period not to exceed ten days before returning the bees to said location if the insecticide known as "Kill-more-bees" is used on said clover seed field or any other blooming plants on the property on which the bees may be working. It is also agreed by said seed grower that any insecticide to be applied to said seed field shall be applied before the hour of 8 A. M. or after the hour of 8 P. M. (California Daylight Saving Time).

Said seed grower reserves the right to employ the services of an official apiary inspector at any time he may see fit to determine the strength of the hives of bees as to their ability to render full pollination activities. Said beekeeper agrees that any hives of bees below the necessary strength shall be replaced by said beekeeper by a like number of hives of bees of full strength.

Said seed grower agrees to pay said beekeeper the sum of $5 per hive for said pollination services. One-third of this shall be paid at the time of placing the bees on location. Balance to be paid at the end of the pollination period or not later than December 1, 1952.

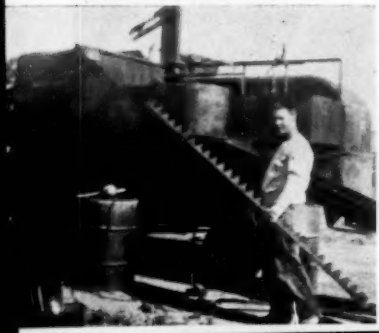
_____
Beekeeper

_____
Seed Grower

* * *

Note that in the contract refer-

Pollination customer, Donald Brinkley, getting his one-man, suction type Ladino clover harvester ready to go.



ence is made to the main questions your new seed grower customer will want to understand before he signs on the dotted line. These questions are: "I know bees increase seed yield but I do not know anything about a hive—how do I know your hives are going to be full of bees, other than just your word for it?" "What happens if we have to spray for insects—won't it kill all the bees? You will lose your bees and we will lose the pollination." "Should the hives be left in the field until all the blooms are gone?"

I use the word "hive" at least until my new customer gets wise—as I was asked once "how many hives do you put in a colony, about ten?" The paragraph which refers to the amount paid the beekeeper can easily be changed to a percentage of the seed as payment.

I find it helps in gaining new business to hand out or mail the bulletin, "Planned Pollination—an Agricultural Practice" by Roy A. Grout, published by Dadant & Sons, Inc., to prospective customers well before the season begins. It is profitable to follow this up with the following information which I believe was originally drawn up by Dr. J. E. Eckert:

According to the agronomists, it takes from 30 to 35 days to mature alfalfa seed, about 30 days for trefoil and red clover, and 21 to 25 days for Ladino clover after the blossoms have been fertilized. This means, then, that the grower can advise the beekeeper of the approximate date he intends to harvest the seed crop and that the beekeeper can remove a majority of the colonies to more favorable nectar and pollen locations for the balance of the season. The grower cannot profit by having a concentration of colonies in his fields during the last three or four weeks before harvest time, and it would be to the beekeeper's advantage to move out a majority of the colonies so the balance can make a surplus of honey and pollen for the winter period.

Many beekeepers in California, who left three to six colonies per acre in the seed area last year until just before harvest, found that their colonies were lacking in strength this spring probably due to a shortage of pollen and honey, as well as to a longer exposure to toxic chemicals.

In many cases, colonies can be moved out of dry land seed areas in time to pollinate legume fields under irrigation. The time of harvesting will vary with the field but should be done before any serious danger of loss from rain.

Pollination is here to stay—the contagion is spreading. Many non-seed growers consider it good agricultural practice to have bees near their crops and we hear such remarks as: "My crops seem to grow better whenever there are bees around," and "I don't have to spray so much since I have bees on my place."

Even my gas station attendant has changed his greeting to "How's the pollination," instead of "How's the honey."

Mechanization Comes to the Bee Industry

by H. W. Longfellow

Farm Adviser
Orange County
Santa Ana, California

MECHANIZATION has taken some of the sting out of beekeeping. A machine now manufactured by the Hopper Machine Works in Bakersfield for loading and unloading beehives was demonstrated recently by Charles B. Reed, prominent Farm Bureau member and president of the Valley Pollination Group, an association of Orange County beekeepers. The machine is mounted to Reed's truck which is in constant use moving bees required by alfalfa and other seed producers for pollination. According to the California Crop and Livestock Reporting Service statistics, approximately 155,000 acres in California were devoted to the production of legume seed in 1951, including all types of alfalfa, Ladino clover, Kenland clover, alsike, and trefoil. Prospects seem favorable for an extension of this acreage in 1952.

At the demonstration at Olive, Reed introduced Ward C. Waterman, representing the Maricopa Seed Farms, who has been largely responsible for the development of the working model. The model cost nearly $4,000 but when it is brought successfully to the market, Reed and Waterman say it should cost approximately $1,800.

The group watched hives or colonies weighing 40-50 pounds each, raised and lowered by a fork lift which swings free on cables attached to a power boom. The boom is run by a 2½ horsepower electric generator. The whole machine is

Charles B. Reed demonstrates new beehive loader, hand operated from the ground.

under electric power. The working parts of the machine, housed above the truck cab, are used to counterbalance the boom which operates off the hoist on a 20 foot radius. The hoist has two levels—the traveling level and the loading or working level. When working, the boom may be raised an additional 20 inches by air compression.

Mechanization of loading and unloading bees has resulted from the need of frequent transportation of bees to seed fields. Since legumes require cross-pollination, the presence of an adequate number of pollinators is a **must** for a good seed set. Solitary bees are sometimes present in significant quantities in fields bordering non-cultivated areas, but on the whole, their number cannot be counted on to be sufficient to ensure a maximum seed set. They are also subject to being exterminated by natural factors, cultural practices, weed control, and by chemicals. Honey bees, therefore, are the only pollinators which can be increased and moved from place to place as needed. The machine not only speeds up the operation but saves labor and handling expense. Reed explained how the average California beeman will move his "crop" five times a year. In the wintertime he will pollinate at home among the orange groves. From June to August he will pollinate alfalfa seed in Kern County. Beekeepers then travel to other parts of the San Joaquin Valley or desert during other parts of the year.

The Valley Pollination Group was organized in 1950, and that year 4,500 colonies were shipped out for rental. This year there are 60 beekeepers in the group.

Growers have recognized the need of bees for pollination for many years but only within recent years has the practice been put into operation in the form of migratory beekeeping for seed pollination as an activity separate from honey production. Formerly, beekeepers sought out locations for their apiaries for the honey they produced. Beehives were placed one colony or less per acre of alfalfa. For clover fields the ratio of colonies was generally one colony to two acres for best results in honey production.

Experience and observation have shown that alfalfa requires from two to five colonies of honey bees per acre to provide an adequate number of pollinators, the number depending on the growth of the plants, strength of colony and the total number of colonies within flying distance of the fields. Competitive plants are also a factor. Ladino clover, alsike, and trefoil require one colony of bees to the acre and Kenland clover from one to two colonies. The number of hives required to pollinate the 1951 acreage adequately would approximate 309,000. There are around 458,000 colonies of bees in California, but to ensure the proper placement of colonies when they are needed, seed growers should contact beekeepers well in advance of the time their fields come into bloom.

The strength of colony should be such that brood is contained in not less than 1,000 square inches by early June with sufficient bees to cover not less than eight frames. Two or three 4-frame nuclei may be the equivalent of an 8- or 10-frame colony. As a rule, the greater the number of frames of brood in a hive, the greater will be the need for pollen to feed the brood.

The hives should be placed to give an even distribution of bees throughout the seed areas and the number and efficiency of bees per square yard, working the blossoms, is the only gauge by which a proper distribution can be measured. Placement in the field depends on the total area to be covered, the number of hives in the area, and the shape of the field. Hives are frequently placed in the fields along temporary driveways used by the beekeeper in the care of his bees. Loss of seed in the driveway is compensated for by an increased amount of seed because of proper spacing and care of the colonies.

Hives should be placed so the bottom boards are above the highest possible level of water and so the hive entrances are not blocked by plant growth. Colonies which are partly smothered by plant growth are also subject to greater injury from toxic sprays and dusts.

Nowadays, when several hundred colonies are concentrated in a seed area, colonies will seldom be able to store a commercial quantity of honey sufficient to make a profitable return to the beekeeper, who therefore needs the rental paid by the seed producer. In years unfavorable for nectar secretion, colonies may have to be fed.

The growing need for bees to pollinate seed and the uncertainty of heavy production in crowded areas has led to the signing of contracts between seed producers and beekeepers assuring each of reasonable returns, based on individual circumstances such as hives required per acre, risk from insecticides, transportation costs, the possibility of honey production and expected yield of seed.

Among the many factors which influence the production of seed are soil and soil moisture conditions, time of planting, the blooming period, irrigation practices, weed control, insect control, pollination, harvesting efficiency, and general weather conditions. Unfavorable conditions in any one of these several categories will affect the yield of seed.

Pollination and Conservation

by August P. Beilmann

The Arboretum
Gray Summit, Mo.

WHEN Bradbury, in 1819, wrote that the introduced honey bee had moved 600 miles west in 14 years, he made a statement of great significance to the beekeeper of today. He said, in effect, that the plants of those days provided such quantities of nectar and pollen that this introduced insect, through its propensity to swarm and establish new colonies, was able to invade the West in a very short time. This was accomplished in competition with all the other native honey and pollen gatherers. The spread was so rapid that the Indian named it the "white man's fly" and stated that when it appeared, the white man was not far behind.

What plants were present to provide such a fabulous food supply for the honey bee? Detailed lists of the plants encountered by the early explorers leave great gaps in our information. We don't know exactly what plants made up the prairie flora. But we learn that much of the country east of the Mississippi and nearly all that to the west was open grassland. The trees were confined to the watercourses. In fact it was said that St. Louis could never grow very large since there were not enough trees in the region to provide rails for fencing! We read that the grass was as high as a "horse's belly," and that in some areas the entwined peas made walking impossible.

Here then is the picture of a new country, so wealthy that it provided virtually unlimited bee pasturage. A country capable of supplying adequate housing for bees; not yet seriously disturbed by the settler, but slowly becoming untenable for big game. This was the great Middle West of Bradbury's time. In little more than a century the settler occupied the grazing land of the buffalo, the elk, and the deer. And within another quarter-century Conservation was born.

The school-age descendants of that same settler are now taught about the conservation of our natural resources. The parents subscribe to and support organizations which in all sincerity and honesty attempt to hold the wildlife that remains. Perhaps there isn't room for buffalo, and perhaps elk would simply aggravate our traffic problem. The "deer crossing" signs in the Ozarks, warning the unwary motorist, may be a sign of the times. But if we can't have buffalo and elk, surely the deer and the turkey, prairie chicken, quail and all the smaller game should find room outside our settlements. Unless we destroy all the native plants that furnished their food.

Much effort is being turned toward the restoration of cover for small game and birds and some little work is being done on the food plants. We are being urged to grow some exotic plants as sources of food and shelter. But what has happened to the native seed producing plants that fed the game and the birds of an earlier year? Why should we place so much dependence upon some botanical trash when our native plants did the job so well some years ago? In our striving to hold what game we have and to preserve some of the plants still living, have we forgotten some catalyst — some ingredient that makes "conservation" work?

I believe we have. We have forgotten the role of the pollinator. The plow turned under more than the sod. It also turned under the solitary and bumble bees. To compensate for this loss, the domestic bee carried on the job during the early 1900's—the "golden age of beekeeping." But the standard practice of keeping a few stands of bees on each farm has declined. There are many millions of colonies, but they are concentrated in areas where they can produce honey from cultivated plants, or where their services as pollinators has proved financially remunerative. The beekeeper may be fully aware of the pollinating services rendered by his charges, but few people outside the industry recognize the importance of this function. And still fewer understand that our diet will eventually be much restricted, or, we may even go hungry because our only crops will be those not needing the services of a pollinator. Long before we reach the hunger stage we shall have suitably lamented the passing of the last bit of wildlife and those plants providing the timely and dependable food supply. At the moment, bees are not being placed in those areas set aside as "conservation demonstration" projects.

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Yet we have had the opportunity to observe the effectiveness of an ample field force of bees in the spread of some native plants. At Hidden Valley, a virgin wonderland deeded to the Garden because of the massive display of uncommon plants, we found a "bee tree" for each 12 acres. No flower, of interest to bees, failed to set a full crop of seed. Ten years ago it was necessary to feed the colonies at the Arboretum during a good part of the summer. Now the surplus obtained far exceeds the amount of sirup which had been fed during some seasons. Along with this we have observed a phenomenal spread into new territory of many of the plants which had grown only in small isolated patches. We see an aggressiveness that leaves little doubt about the ability of many species to compete if adequate seeding occurs. And by actual feeding tests with quail we know that they have a preference for some of these native plant seeds—by observation we learn that deer also have little trouble finding these native plants.

Let's stop combing the world for plants possessed of the capacity to solve all our conservation problems with the scattering of a little seed. At best such plants can be but a stop-gap. A later generation must hopefully search for and add additional species while the conservation problem darkens and the game laws tighten. Let's return to those plants of Bradbury's time. Many of them still exist and there was no shortage of game food then. It will not be necessary to "clear" the native plants with all the State and Federal agencies so that their combined effort will prove they are not weeds! Let's allow the bee to replace the pollinators which were turned under with the sod. Add the alchemy of the bee to conservation. This catalytic agent will help clothe the worn spots through the production of seeds from plants which have demonstrated their capacity to do the job.

The Management of Bumble Bees

by B. Elwood Montgomery

Associate Professor of Entomology
Purdue University
Lafayette, Indiana

DARWIN appears to have been the first to point out the importance of bumble bees in the pollination of red clover, when he wrote, in 1859, that "...the bumble bees alone visit the common red clover (**Trifolium pratense**) as other bees cannot reach the nectar. Hence, I have no doubt that if the whole genus of bumble bees became extinct or very rare in England... red clover would become very rare and disappear." He also stated, somewhat later, that with one exception, he had never observed honey bees working red clover except through perforations in the corolla made by the short-tongued bumble bees. This matter of red clover pollination was the center of a bitter dispute for many years, but Plath, in 1925, pointed out that the importance of bumble bees was established beyond a doubt in the years following 1885. In that year bumble bees were introduced into New Zealand where no red clover seed had been produced previously, even when honey bees were placed in the fields, and within five years yields of 500 and 600 pounds per acre were obtained regularly. Plath carried on some experiments in the vicinity of Boston and concluded that little or no red clover seed would be set in the absence of bumble bees.

However, much work has been done since that time and Westgate and Coe determined as early as 1911 that "the honey bee can be as efficient as the bumble bee" under special conditions—in irrigated areas or during periods of low moisture supply where very few other nectar producing plants are available.

There is a rather general agreement that honey bees almost refuse to work red clover when more attractive plants are in bloom; that the deep corolla tubes are probably the limiting factor in bees working red clover and that pollen, itself, is not sufficiently attractive unless competition is at a minimum. In spite of these deterrents we have continued to use honey bees for red clover pollination because "the honey bee is the only pollinating agent that can be managed by man."

About the only "management" of the bumble bee in the past was its introduction into New Zealand. However, after I had made a survey of bumble bees and red clover seed production in that country during the season of 1949-1950, I considered the close zoological relationship of the bumble bee and the honey bee and I see no reason why

methods to "manage" the bumble bee cannot be developed.

The colonial life of the bumble bee differs radically from that of the honey bee in many respects so that Bombiculture, if it is ever developed, will be quite different from Apiculture.

During the middle of the summer the bumble bee colony works much the same as the honey bee colony —the queen remains in the nest (unless disturbed) and appears to do no work except lay eggs, and the workers gather nectar and pollen and do the "housekeeping." Late in the season there is a change in the brood rearing; workers are no longer produced, but many (sometimes several hundred) queens and drones are produced. Usually the drones leave the colony immediately upon emergence from the cocoon and do not return, but the young queens remain in the colony for some time, even gathering nectar and helping in the work of caring for the larvae. The queens and drones mate and the queens burrow into the soil for hibernation before the coming of cold weather. A small number of workers and, sometimes, the old queen, may survive in the nest until the first heavy frost or freeze, but only the young, fertilized queens survive the winter. In the spring these queens emerge from hibernation, and after a few weeks search out a suitable site (old mouse or bird nest, bunch of fine grass, etc.) for the establishment of a nest. Until the first generation of workers is produced the queen continues to visit flowers, gathers nectar and pollen, produces wax (which is used for cells in which to store honey until empty cocoons are available and is also mixed with pollen as food for the larvae) and cares for the nest.

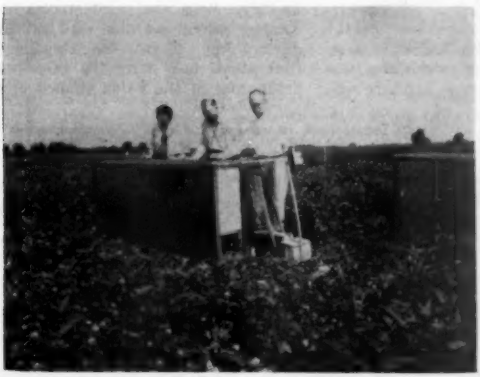
Our first work with bumble bees for red clover pollination has been concerned with the development of methods of handling colonies and queens. Although we have not yet domesticated bumble bees, or even developed methods by which we can have as many as we need for our experiments, we have been able to carry through every phase of the life cycle in small cages. The cage which is used consists of a package bee shipping cage with a small box (approximately 6"x6"x6") attached to one end. A one-inch auger hole through the end of the cage and the adjacent side of the box allows the bees to move freely back and forth.

Colonies of bumble bees moved from their natural locations to the box and furnished a honey-water mixture in a fountain-feeder in the cage and pollen pellets trapped from honey bees placed directly into the nest have continued their normal life and produced a generation of queens and drones in the fall. The queens and drones have mated in these cages and mated queens released in the greenhouse and in a large outdoor cage have burrowed into the soil for hibernation. Some of the queens released in the outdoor cage last fall hibernated successfully and were returned to the small cages this spring. At the time this is written they are still alive. Many queens were captured this spring and placed in the small cages in an attempt to secure the establishment of nests. Two queens have established nests and both colonies have developed workers.

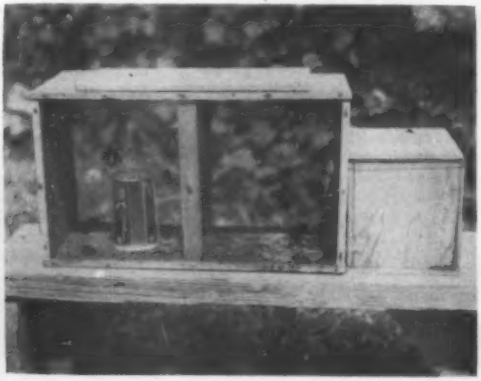
Using the methods which we have developed the past two seasons we hope to be able to move enough colonies of bumble bees into our experimental plots this year to study the activity and efficiency of colonies and individual bees in pollinating clover. We shall try to determine how many bees from a colony are in the field at any given time, how long each field trip lasts and how many blossoms a bee visits during a field trip. Attempts will be made to determine how much seed can be produced with maximum pollination by caging colonies over small areas.

Although these studies are concerned only with bumble bees, they should be of considerable interest to beekeepers for several reasons. If and when, methods are developed for managing bumble bees, beekeepers will probably be the "managers." Then, bumble bees can be kept for red clover pollination and honey bees for honey production and the pollination of other plants for which they are better suited. Even when honey bees work red clover intensively a considerable number of florets are probably not pollinated because of their great length. These florets will be visited by bumble bees, so that the use of both bumble bees and honey bees (when the latter will visit red clover) would probably produce more seed than the use of either alone.

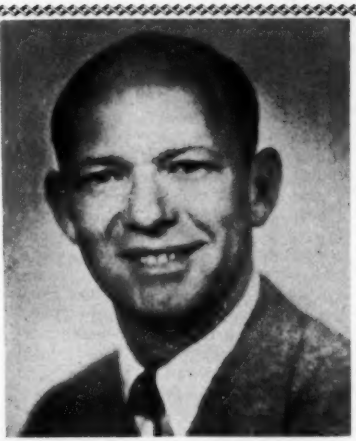
Large cages like these are used in experiments to determine the efficiency of bumble bees in pollinating clover.



Every phase of the life cycle of the bumble bee has been carried through in this package bee shipping cage adapted for the purpose.



A Six Million Dollar Native Bee in Washington State



by Herman F. Menke[1]
Entomologist
Assistant Manager,
Andrews Seed Company
Harrah, Washington

THE alkali bee (**Nomia melanderi** Ckll.), a native species of western America, plus Washington's 28,000 acres of alfalfa seed teamed up to produce the second largest seed crop in the U. S. last year. Some figures[2] on the tremendous growth of the seed industry in this state are of interest. The annual average alfalfa seed acreage harvested from 1940-49 was 3,150; in 1950 this jumped to 14,300 and by 1951 was 28,000. Striking data are the average yields per acre of thresher run seed — 1940-49, 189 pounds; 1950 and 1951, 630 pounds. In two years, Washington has become the second largest producer of alfalfa seed and number one on yields per acre. On an acreage basis, Washington produced almost twice as much seed as its closest rival, California, and about five times the national average of 138 pounds per acre.

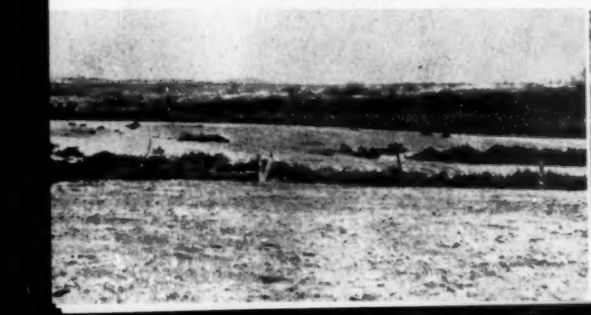
This state is unique because it is probably the only case where the honey bee is not the most important pollinator of alfalfa in a large seed area. Those familiar with the pollination problem of alfalfa know it takes large bee populations that trip millions of flowers for good seed yields. Two years of study indicates the alkali bee females trip over 95% of all flowers visited and that honey bees (nectar collectors) trip less than 1% in Washington. Apparently in one restricted area, Mosea Coulee, the honey bees gather pollen from alfalfa and set good seed crops. In the principal seed area the honey bees gather nectar but very little pollen from alfalfa.

Last year 203 honeybees were studied as they visited 11,261 alfalfa blossoms. Emphasis was placed on bees in fields within 50 feet of their colonies in hopes some of the young "uneducated" ones would be tripping more than other bees. The data were taken in numerous fields in three general seed areas so they should be representative of our principal seed areas. One-quarter of one per cent of the flowers visited were tripped. Even at this low tripping rate if the field force of three colonies per acre was visiting the alfalfa they would set about 200 pounds of seed per acre in 40 days.

The alkali bee nests in sandy loam soils, cleared or semi-cleared, and where the soil is constantly moist. Sometimes there are fifty bees per square foot and a nesting site may cover an acre or more. Since they are especially fond of alfalfa pollen to provision their nests and they concentrate in areas, an acre bee site can produce sufficient bees to trip enough blossoms to set 1,200 pounds of seed per acre on 200 acres in 15 days.

Weekly bee population counts in five commercial seed fields the last two years indicate there are one-half to two alkali bees per square yard during July in the principal alkali bee region. Even though commercial apiaries were in the region for honey production, honey bees were seldom seen in the fields when the counts were made during midday. Since the plant studies indicated nearly all the seed is set during July, it can be concluded that alkali bees were the principal pollinators of the fields studied and

1. Formerly Assistant Entomologist (Apiculturist), State College of Washington, Pullman.
2. USDA, Bureau of Agricultural Economics Crop Report, 1951.



Typical alkali bee nesting site in background. Notice the dark outcropping of alkali soil on the knoll.

Male alkali bees (Nomia melanderi Ckll.) clustering on sweet clover. The light colored bands on their abdomens are irridescent pale green to greenish-bronze in color.

that populations of one-half to two alkali bees per square yard are sufficient to set large seed crops (800 pounds or above per acre).

Certainly the important factors of cultural management and careful harvesting, along with proper insect control, must also be favorable to produce average yields of 630 pounds per acre. However, in the West, with irrigation and a relatively long, dry growing season, pollination seems to be the most critical problem in production. Field demonstrations which excluded bees from alfalfa and numerous meetings where data on Washington seed studies were presented have sold growers on the importance of tripping (insect pollination) to commerical seed yields. Farmers follow recommendations on the management of present alkali bee sites and how to develop new ones. They reduce bee poisoning hazards by timing their insect control programs, and using materials low in toxicity to bees if they must be applied during bloom.

Research has led to the valuable recommendation on how to "Farm with Wild Bees." Growers located in the alkali bee region of the state (Yakima and Benton counties) cut their first crop of hay between May 15-20. Why? Then the peak bloom period occurs at the same time as peak alkali bee activity (July). Since there is only one generation of bees each season, growers have to get the most out of them in a very short time. Studies the last two years on the bionomics of this native bee has led to additional suggestions on how to "Farm with Wild Bees." Conservation practices to protect present nests and how to prepare land to attract them in new areas are two examples.

Even though the alkali bee has only been found in large numbers in the lower Yakima Valley, it has been collected at Moses Lake, in the Columbia Basin Project. About 40-60 thousand acres in this million acre irrigation project will probably be devoted to legume seed production. It is certain honey bees will be very important in this region. However, since alkali bees are so effective in alfalfa, some experiments have been conducted on the artificial movement of them to new areas. Limited success has given encouragement; however, it is too early to state whether it will be feasible on a large scale.

Kenland red clover and Ladino clover are two important crops on which honey bees are being used extensively with great success in our state. Even though the alkali bee is the number one pollinator of alfalfa today in Washington this may not be so in a few years. Studies of the past tell us that native bee populations fluctuate greatly so we are not putting all our research eggs in one basket. Every year more experiments are conducted on the use of honey bees in legume seed production.

A greater research program conducted cooperatively by agronomists, economic entomologists, and insect pollination entomologists will enable Washington to look forward to setting even greater records in seed production.

The Value of Bees as Pollinators

by W. E. Monroe
Associate Agronomist
University Station
Baton Rouge, Louisiana

"THE absence of honey bees can starve the people to death quicker than the influence of all the Communist forces combined." This statement was made by an authority on bees and many people will probably think it is an overstatement. Regardless whether this is an over- or understatement, the real value of bees is not in the making of honey and wax, but in their effect on seed production of various crops. For every dollar received by beekeepers for honey and wax, bees contribute to agriculture about fifteen or twenty dollars. Many of our crops are wholly dependent upon insects for pollination. Most of our clovers are self-sterile and must be cross-pollinated. Their flowers are so constructed that wind pollination is impossible.

Many experiments have been conducted to show the value of honey bees in clover seed work. All these experiments vary, but the average is just about like the one conducted on red clover. Cages that excluded all insects but gave an ample supply of light were used. Only twelve pounds of seed was produced per acre. Where field pollination existed with an average supply of bees, the clover produced 280 pounds of seed per acre. The additional 268 pounds of seed was brought about by insects. The people who are not informed as to the value of honey bees in pollination may argue that insects other than bees may be responsible for the clover seed set. A further study was made to deter-

mine the extent to which honey bees aided pollination. For 43 hours, a study was made to determine the number of insects that visit clover. Nine insects other than bees were caught per hour. During the same 43 hours, 300 honey bees were caught per hour. This, and other studies, shows that 80 to 85 per cent of all pollination of clover is done by bees. When red clover and bees are mentioned, that brings about the old story of the bumble bee. It is a well-known fact that red clover sets very few seeds, if any, on the first crop of blooms. For some time, we at the University, went along with the story that the reason for this is that the honey bee could not pollinate red clover, and only the bumble bee could do the job. The old story goes that the bumble bee comes out just in time to pollinate the second crop of blooms. Ohio State University made a study to see exactly how red clover was pollinated. They found that 28 insects worked red clover. From these 28 insects, 82 per cent of the flowers were pollinated by the honey bee, 15 per cent by the bumble bee and only 3 per cent by the other 26 insects. With these facts showing that the honey bee is the main pollinator, it still remains that the first crop of blooms sets only a few seeds. This study was continued for three years and it was found that while white clover blooms are available, the honey bee will not pollinate red clover. There is a reason for this—taste preference—the same reason that makes most of us pass up potted meat if we can have a nice thick juicy steak.

Bees are worth more now to the South than ever before. Row crop operations are going out of the picture and being replaced by grassland farming. All grassland farming programs are made up of grass and legume combinations. Even if commercial seed production is not considered, bees are needed to produce enough seed for reseeding. The grassland farming program also includes rotation of row crops and pasture crops. This means more and more seed will be used by the southern farmer. In many cases everyone will produce their own seed. This only means one thing—more and more bees will be needed.

In the past, two groups of farmers in Louisiana did not need bees to pollinate their crops. They were the cane farmer and the rice farmer. Cane is propagated vegetatively and rice is self-pollinated. The change in times and methods of farming makes these groups highly dependent upon bees for carrying out their operations. The need for new sources of income and to control Johnson grass in the sugar belt is forcing the cane farmer into a livestock rotation. These three to five-year rotations in the cane and rice belt mean that clovers must be planted often. This means more bees are needed to produce this extra amount of seed.

Many people are not aware of what a large job it is for bees to pollinate an acre of clover properly. When we eat two eggs for breakfast and stop to realize that two eggs represent a full week's work for an average chicken, we think we use up animal energy in a hurry. Let us compare this with the vast amount of energy that is required for bees to pollinate an acre of clover. An acre of clover has about 300,000,000 individual flowers. For every pound of clover seed produced, 75,000 flowers have to be visited by the bees. To produce 100 pounds of seed per acre, the bee has a real job. One bee will visit about 350 flowers to collect a load of pollen. To collect a pound of pollen, bees have to make about 8 million visits and a strong colony will collect 60 pounds of pollen in a year. Thus, the old saying about the busy little bee is really a true statement.

The distance the bees have to travel makes a big difference in seed production. The results of a study on white clover show that when bees were in the field or within ¼ mile, the seed production was 144 pounds per acre. When bees were ½ mile away, seed production dropped to 105 pounds, while only 56 pounds were produced when the bees traveled one mile. This shows the real value of having bees in a clover field. Ohio State University has shown that seed production can be increased by using up to 6 colonies of bees.

The total value of bees to clover seed production is not fully realized by most clover growers. Beekeepers should not be discouraged by this, since it is just an educational job that must be put over. All forms of education are slow, so this information cannot be given to the clover grower overnight. Many people will remember the time when landowners demanded large sums of money from oil companies for the privilege of drilling an oil well on their land. Times have changed and everyone wants an oil well on his land. Some day the same situation will prevail with clover growers and beekeepers. Both parties must consider the value each gets from bees and clover and cooperate to the extent that both will benefit.

Standards for Grading Honey

P. J. Gonnet (France) in his new book "Le Miel-Parfum, Saveur, Arome," questions whether we Americans are not missing the issue in our honey classifications by depending on color, body and a rather neutral flavor. He contends that classification should be by odor and flavor primarily.

Perhaps we have sacrificed something, even in sales of honey, by confirming to those standards, and possibly by our generous heating and clarifying we have removed some of those very essentials which may occur in honey that "tastes just like that of my boyhood." Maybe that is why we sell more readily the bulk comb honey of the South, regardless of its color, as long as the flavor and aroma are there.

Gonnet claims, and with reason, that even the fine comb honey of today has lost something of the flavor of old-time comb honey cut out of a straw skep or box hive. With such honey we got a certain amount of pollen and some propolis, while our modern comb-honey producer makes sure there is no travel stain, no pollen, and even paraffins the sections to prevent it.

The French are great tasters and smellers. They readily judge wine by its aroma, and they catch its distinctive flavor. According to Gonnet, there are only four taste buds: sweet, acid, salty and bitter. All the rest is flavor and odor combined.

The Gonnet book gives one food for thought. We find some of our best markets for our so-called off-grade honey in the European countries where they have long ago learned to appreciate and use their taste buds and their noses in judging the food they eat.

The author devotes a part of the space to a classification of French honeys by flavor and odor.

The publisher is Librairie Apicole, Montfavet Vaucluse, France. The book has 125 pages, is paper, and sells at $1.50.

Foxglove, Digitalis purpurea, a tall herb, reported in some places as a source of surplus, yielding a golden honey of good flavor.
(Photo from C. R. Freeman, Honeydew, California)

The above photo pictures the unique blooming habit of Everflowering Locust (Robinia pseudoacacia semperflorens). Shown are the fading blossoms near bottom of picture, newly opening blossoms at center and several forming blossom buds near the terminal. These trees at the honey plant gardens bloom in varying amounts over a three months' period.

This Dearborn saw, easily attached to the tractor, travels any place the tractor will go. It is operated by the tractor's power take-off. Should be of value to the beekeeper for various jobs.

John De Muth & Son's long truck with rack body. It holds 75 (10 frame) hives flat; when decked four high, 300. Loaded in New York, with two drivers each on a four-hour stretch, trip to Florida is made in 36 hours, 1330 miles.
A. G. Woodman, Michigan

The above photo caught several bees on a flower cluster of Golden Honey Plant. This plant, also known as Wingstem, is Actinomeris alternifolia which is native to the middlewest and eastward. It grows on fertile soils in sheltered situations as woodland edges and sparse timber. It is a free yielder of nectar blooming in August. It will give a boost to fall buildup or produce surplus honey in the few places where it is yet plentiful.

The Trace Minerals and Honey Plants

by Robert M. Mead

BECAUSE of a new dam, the railroad had to raise its track bed. The fill was made with the poorest kind of soil. It was full of rocks and at first glance one would have declared that plant life could not exist on it. It was near one of my small outyards so I kept watch. By midsummer seedlings of many good honey plants—white Dutch clover, sweet clover, vetch and others—were growing more thriftily on this inhospitable looking ground than they were on nearby tilled farmland. Why?

The answer lies in trace minerals; the dozen or more rare elements so necessary for completely healthy plant life that leach out, or are used up, from our tilled soils. The railroad fill might look like poor soil but it was nevertheless virgin soil, not rich perhaps in the sense of a fertilized garden, but rich in all the elements that should be there. So the seedlings grew with unparalleled vigor, and they will continue to do so until this soil is in turn spoiled by leaching, burning over, or whatever means of soil or plant torture the railroad men may devise. (Use of weed killing sprays, salts and oils along the right of way has become common, killing not only weeds but some good honey plants.)

Any beekeeper with his eyes open can see the same thing happen over and over again. Honey plants grow with special vigor on virgin soils, cuts, fills and graded soils where virgin soil or its equivalent is brought to the surface, and sometimes on flood land where the silt may, or may not, contain the elements of a virgin soil.

Some of these trace minerals are boron, magnesium, copper, iron, cobalt and iodine, plus others, depending on the location. The exact chore of these elements in plant nutrition is not so easy to explain. We understand the need for nitrogen, potash, phosphate, water, and sunshine and perhaps it is easiest to say that the rare elements act as a catalyst that enables the plant to make more perfect use of the more common plant food elements.

All this has a great deal to do with honey production. In more severe cases of mineral starvation the plant does not grow at all, or becomes weak or sickly. Most of the older beekeepers are familiar with some region that has played out as a honey producing area, without exactly knowing why it has. The reason may well be that the soil has deteriorated in some rare but vital mineral to the point where honey producing plants just cannot grow.

By far the largest area in the United States, however, is in a marginal condition as far as trace minerals are concerned. That is, most all honey plants suited to the region may grow, and grow fairly well, but they do not give good or dependable yields of honey, and may give very erratic yields of seed. Where such conditions exist, only the most detailed soil study and numerous experiments can result in finding the necessary item for bringing the crops back to maximum production. It is important to remember that the lack of these vital trace minerals may show up as a plant disease. In other words we jump to the most obvious conclusion, that the plant is sick, instead of to the true conclusion, that the soil is lacking.

While plant life and animal life are not alike in some respects they are much alike in others. Deprive either the animal or plant of an increasing number of elements necessary for nutrition and both retrogress to the point of mere existence instead of performing their normal functions of production and reproduction. We might say, as it is not absolutely necessary for a plant to produce nectar, that this would be one of the first functions the partly starved plant would drop. As it becomes progressively more starved, it might produce very few blossoms or in the end none at all, remaining merely as a bunch of stunted leaves on a weakened stem in a last desperate bid to stay alive.

The symptoms of mineral starvation in plants are such that most beekeepers, seed growers, and farmers can recognize them, but of course, the starvation may be mild enough so that everyone gets fooled except the bees and the thresher. The most outstanding indication, of course, is when the plant just does not grow, although the soil has the appearance of fertility. Other signs are lack of seedling vigor, weak stems, lack of color in foliage, tendency to abort bloom buds before they open, inability to set fruit and finally lack of quality or vigor in the fruit or seed that is set. As I have indicated all along, we are often treating "disease" or crying about "run out" crops when the real problem is basically a problem of plant nutrition.

The cure is not always easy. The amount of the trace mineral needed to the acre may not be more than might be balanced on your thumb nail—so small that to many growers the whole subject seems silly. However, there are some things that can be done. The age-old practice of rotating crops allows the soil to regenerate partly its lost minerals through bacterial and chemical action. This would not be true if the nutritional needs of all plants were the same, but fortunately they are not. Grass may grow very well on soil that cannot support a flowering plant. The use of chemical fertilizers, although ridiculed by some, may be just the thing needed as that fertilizer may contain the trace mineral as an impurity. The best remedy, of course, is to replace the exact element needed and this is best done by spreading a fertilizer containing the trace mineral. It would be impractical to spread a pinch of cobalt, for instance, evenly over an acre but it is practical to treat the acre with a thousand pounds of 5-10-10, for instance, which has the trace of cobalt in it.

A great deal more study on the subject is needed but where crops fail, both grower and beekeeper should seriously consider the need for trace minerals before the crop is permanently abandoned.

Vermont

By Observation

by T. J. Wells

WHY is it that a beekeeper has to have five or ten years' experience before he can do things the easy way? I remember I used to go through every hive, examining every comb, every week for two months and I didn't get the crops that I now get. For the last several years I have been doing a lot of my work by observation. For instance, you can tell by looking at the entrance when a hive gets the swarming fever; then that hive is the only one to work at that time.

Most of my bees get only three examinations a year. Early in the spring I give them a check for stores and see if the queen is laying. Then throughout the season I check individual hives as they need it by observing the front. During the last part of August I requeen every hive with a young queen, which operation calls for a thorough examination. In about two weeks they are examined for the third time, this time to see that the queen is accepted and to check on winter stores.

All of my bees are in double hive bodies for brood and stores. I use two or three shallow extracting supers and when they are full I extract them and put them back on. This, I believe, cuts down on work for the bees as they must carry honey a long distance when you leave the entire crop on. This system also cuts down on the amount of equipment needed. It requires more labor but I believe the results are worth it.

I mark each super with chalk when it has been extracted, No. 1 the first time, No. 2 the next time, and so on. I remember one year some of the supers were extracted five times. I use chalk to do the marking as it can be erased at the end of the season.

I often think about some of the sorry beekeeping I used to do. I used to have an excluder for every hive and put it on at the beginning of the season whether needed or not. I had only one brood chamber, extracted everything above it, and I knew the bees couldn't possibly make it through the winter. That year I lost 18 out of 30 hives and it took the next season to build the other 12 up to colony strength. Then I disposed of the excluders; now I use them again on occasion.

"There is nothing like experience, absolutely nothing like it." And when I think about it, I think of a phrase once said by G. H. Cale, "Beekeepers are so Scotch." There are thousands of beehives today that are robbed too closely and even though they make it through the winter, they don't build up to thriving colonies until half the season is gone. I have talked to some up and coming beekeepers who said they were so Scotch, that they left at least two full hive bodies of honey for the bees.

I have a little sign down at my gate with my name and "Beekeeper" on it. I have thought of taking it down a dozen times, when I realized how little I know about honey bees, but there is one thing I do know, the hive in the picture is just beginning to get the swarming fever. I figured that out by observation. Want to know what I did to it? Well, I cut all queen cells, removed the upper brood chamber leaving the queen in the lower one,and gave them a new brood chamber with frames of foundation. I found the hive full of white vetch honey from the top to the brood. I gave the brood chamber I removed to a young colony that I started in the spring making it two.

This idea will not fit most beekeepers at all, and you beekeepers who winter your bees in four brood chambers will know how far behind I really am. But to all of you, I ask: "What can you tell by observation?"

Oklahoma

HELP CANCER RESEARCH

An opportunity for beekeepers to help in cancer research is now open. Through the efforts of Charles Mraz of Middlebury, Vermont, the Sloan-Kettering Institute has decided to promote cancer research with pollen, royal jelly, bee venom, and so forth. This means an investment of thousands of dollars and all beekeepers can help by supplying the Institute with royal jelly.

Collecting the jelly is a simple process. The cells are simply cut out of the combs and put into a box. They are then taken home, the larvae taken out and the jelly squeezed into a tight jar. This is kept in a refrigerator until filled. It can then be shipped, well packed, direct to:

Dr. C. Chester Stock, Sloan-Kettering Institute for Cancer Research, 444 East 68th St., New York 21, N. Y.

Let's do our best to help this vital project.

From the Honey Plant Test Gardens

by Melvin A. Pellett

(Top) Bittersweet (Celastrus scandens) blooms in early June.

(Left) Native bittersweet growing on a high fence. It furnishes cover and feed for wildlife.

(Right) Bittersweet berries turn bright orange color—later crack open to bright scarlet.

EACH fall we spend a day gathering bittersweet. The whole family pitches in on a Saturday with enthusiasm for the interesting project of gathering and preparing the berry laden branches for market. The clusters of plump berries turn to a bright orange color in early fall. Later the berries crack open to a bright scarlet color. This material is in demand for winter bouquets. Some wholesalers in large cities pay 25 cents per pound plus transportation charges for the well-laden branches when properly handled.

Our harvest of bittersweet so far comes from a road fence on the far side of our place where we left it to grow when we cut other brush and vines from the fence. Later we found that we had enough of the decorative material to make marketing worth while. There are some drawbacks to having it on a road fence. The growth is getting heavy enough to be a bit hard on the fence. Also people driving out in search of winter decorations have learned where it is. So we must get there early in the season ahead of the rush to harvest the marketable branches; then say to those who inquire (most of them don't), "Why sure, just help yourself." We have now started several rows of bittersweet across the field where we will erect a trellis for it, to try it out as a commercial crop.

Our native American bittersweet (**Celastrus scandens**) is a climbing shrub or vine easy to grow in suitable environment, native to much of the Middle West and eastward. In addition to being sought for decorative material, it is valuable for wildlife conservation, furnishing cover and feed during the fall and winter months. The plant blooms here in early June and the bees work the blossoms freely. Considering these several attractions, we expect there will be much wider use made of this plant.

This year the late spring and early summer blooms did not follow quite the usual sequence as there is much more overlapping than common. Our early spring was a trifle backward with more than the usual amount of rain and cool weather in April. Beginning with the last days of April we had a spell of unseasonably warm weather which was more like June. Thus in early May vegetation grew fast and many of the flowers came into bloom earlier than usual. The flowering of some plants was longer than usual and of most has been plentiful. The rapid pushing ahead of the season in May brought more than the usual amount of flowers into bloom at one time. We noted that in many cases we did not find as large a concentration of bees on one kind of bloom as in years when the season was more extended and there was less bloom at one time. The first white clover blossoms were opened the last days of May with yellow sweet clover in bloom before the middle of June. The many minor sources have done well and so far it is a honey year. Some of those plants on which we noted the bees working most heavily are: **Caragana arborescens**, meadow sage, Cotoneasters, Virginia waterleaf and honey locust. Harold's hive on scales gained 200 pounds from May 26th to June 21st.

Mr. and Mrs. Harvey Lovell recently made a visit here at the gardens. Mr. Lovell is in the Biology Department of the University of Louisville. Harvey's father and my father were very close friends through much correspondence over many years. Lovell, having written the book, "Honey Plants of North America," and Pellett, author of "American Honey Plants," found much of common interest. It seems Harvey and I have both picked up the spark of interest which intrigues us to carry on with further investigation of honey plants. Harvey says that my father went to see his father once and that now he has returned the visit.

From Diagonal, Iowa, comes a report that some Empire strain of bird's-foot trefoil grew 45 inches tall last season. Bird's-foot trefoil is coming into prominence as a permanent pasture and meadow legume in northern states from New England westward to Iowa, Minnesota and Missouri. It is also increasing in the Pacific Northwest. Relatively slow to establish, but long lived, it produces a high quality forage. It will grow on some soils of low fertility.

We have yet to learn about the value of bird's-foot trefoil as a honey plant, as that may vary greatly with season and locality. Reports so far lead us to believe that it will be generally of value to the bees and likely a major source for some localities. Honey bees do have a great influence in the amount of seed set.

Our friend, John E. Johnson, of Verona, Missouri, has been keeping bees for over 65 years. He says he began when C. P. Dadant and A. I. Root were very young and has been at it ever since. He has been experimenting with honey plants through the years and says he thinks more than ever of Vitex incisa negundo; also of Simpson honey plant and golden honey plant which are fine. His vitex last year was in full bloom July 1 and still in bloom on September 13. He can depend on it for two to three months of solid bloom. He has over ten acres of golden honey plant along the little river near his place which he started a number of years ago by planting scattered clumps of this plant and others in their proper environments. They have gradually spread in time to be a great help to his apiary.

The Wax Moth in Early Days

The series of three articles by Dr. V. G. Milum, the last one of which appeared in our July number, has been widely commented upon. Our old friend, Dr. H. M. Fraser ("Beekeeping in Antiquity"), suggests that Thatcher, Smith and Weeks might show how early the wax moth started to pester the American beekeeper. Fortunately we had all of these early American bee books in our library here at Hamilton.

James Thatcher, author of "Practical Treatise on Management of Bees," 1829, Boston, gives a good description of the moth and its terrible devastations on New England colonies. He recommends sweetened water to attract and kill the adult moths.

J. Von Crownshield Smith in "Essays on the Honeybee," Boston, 1831, largely backs up the descriptions by Thatcher, but he advises the use of lights at night around the hive rather than the sweetened water.

John Weeks, who wrote "Manual of Managing Bees," Boston, 1839 and 1840, was from Vermont. He repeated the statement from Thatcher that the moth was imported from Europe. He evidently had had years of experience since he says, "I lost my whole colony four times since 1808." Through his long experience he had learned something about moth control. He was also the inventor of the Vermont hive of which he says, "By using the Vermont hive, strictly adhering to directions given in the Manual, the manager of the bees is enabled to control the size of his colonies to a degree and keep the numbers of the original stocks full."

Give Weeks the credit for announcing that strong colonies will combat the wax moth successfully. He later says that many of the losses laid to the moth are the fault of the beekeeper who allows his colonies to become weak or die out while the moth takes over and destroys the combs.

MEETINGS

Tidewater Beekeepers Set Plans

The executive committee of the Tidewater Beekeepers' Association, whose membership includes beekeepers from twenty-five counties of the Tidewater area, set plans for the forthcoming beekeepers' meetings on August 18 and September 4 and 5 in Newport News, Virginia. Seated left to right: John M. Amos, Extension Apiarist from VPI, Blacksburg; T. L. Belvin Donnelly, treasurer; Miss Emma C. Mast, secretary; (standing) Ray Womble, president; and Elmer B. Givens, vice-president.

Middlesex County Beekeepers Ass'n.
Groton, Mass., August 23

Middlesex County Beekeepers Association will hold a regular meeting at the summer home and apiaries of member James Delory at Groton, August 23, 1952, at 2 P.M. This is one week earlier than usual so as not to conflict with the Labor Day week end. Beekeepers in the vicinity are welcome to visit with us. Bring picnic basket and chairs; the association will furnish coffee and ice cream. Hear all about the plans for the big National Honey Week program set for October 26 through November 2.

John H. Furber, Sec'y

Berks County Beekeepers Ass'n.
Leesport, Pa., August 9

The Berks County association will hold a summer meeting and picnic on Saturday, August 9, 1952 at 2 P.M. at the packing house of the Ontelaunee Orchards, one-half mile below Leesport. E. J. Anderson and W. W. Clarke from State College will be present as well as Harry B. Kirk, chief bee inspector from Harrisburg. This year there will be amplifiers.

There will be an election of officers, fine speaking, games and plenty of refreshments, including that delicious honey ice cream.

Henry F. Phillips, Sec'y

Los Angeles County Fair
Pomona, Calif., Sept. 12-28

More than a million visitors are expected to view the outstanding apiary display to be featured in the beautiful palace of agriculture at Los Angeles County Fair in Pomona, Calif., Sept. 12 to 28. The attraction will form a part of the fair's silver jubilee anniversary.

Under the able showmanship of George Adamson, veteran California bee man, a splendid program of competitive exhibits has been arranged and listed in the premium book now off the press. Substantial cash prizes will be awarded for the most original display of honey, bees and bee products by either an individual producer or a producer organization. There is also a full classification for comb and extracted honey and beeswax. Another classification covers a wide range of baked goods and candies made with honey.

Entries for the competition close Sept. 9. Copies of the premium book can be had by writing Los Angeles County Fair headquarters in Pomona.

Annual Vermont Picnic
North Thetford, August 23

The annual Vermont Beekeepers Picnic-Meeting will be held Saturday, August 23, 1952, starting at 10 A.M. The location of the meeting is the residence of Edwin Roberts in North Thetford, Vermont; about a third of a mile south of North Thetford, turn west off route 5 about 1/3 mile.

Our guest speaker for the day will be Edwin J. Anderson from the Pennsylvania State College. Mr. Anderson has a great deal of experience with beekeeping in its many phases and will give an informative and interesting talk. We hope all Vermont beekeepers and friends will come to welcome our guest from Pennsylvania as well as all our beekeeper friends from other states.

Chas. Mraz, Sec.

Ohio State Beekeepers Assoc.
Jefferson, August 5-6

The state meeting will be held at the Grange Hall, Jefferson, Ohio, on August 5 and 6.

Program

August 5—Morning

9:30—Welcome address, Mayor of Jefferson

10:00—President's address, George Rehman, North Baltimore

10:30—Results of Bee Registration in Ohio, S. E. Bailey and John W. Barringer, Columbus

Afternoon

1:00—Comb Honey, Edgar Williams, Pierpont

2:00—American Beekeeping Federation News, H. R. Swisher, Springfield

3:00—Tricks of the Trade, E. W. Long, St. Paris

Banquet

Jere Frazer, Chillicothe, Toastmaster

Paul Cutts, Chipley, Fla., Guest Speaker, The New South

H. H. Root, Medina, Beekeeping films

August 6—Morning

9:30—Panel Discussion, Chas. A. Reese, Columbus, Leader

10:30—Speaker

Afternoon

1:00—Panel Discussion, The Beekeepers New Year, M. J. Deyell, Medina, Leader

2:00—Results of Spraying and Pollination of Clover Seed, Ted Gran, Jr., Perrysburg

Geo. Rehman, Pres.

Summer Meeting
Empire State Honey Producers
Mariaville, N. Y., August 16

The 85th annual summer meeting of the Empire State Honey Producers Association will start at 10 a. m. Saturday, August 16, at the home apiary of George Walthousen, at Mariaville in Schenectady County, according to Dr. E. J. Dyce, professor of apiculture at Cornell. A large pavilion will be available for the meeting which annually attracts about a hundred beekeepers.

Professor Dyce will discuss apiary management and honey marketing. Dr. Wm. Coggshall, Cornell's extension beekeeper, will review the birdsfoot trefoil investigations conducted at the Cornell Agricultural Experiment Station. This plant, a legume, promises a new source of income through pollination.

Representatives of bee supply companies and leaders from other state beekeeping organizations will be guests of the association.

A honey queen will be chosen to represent the beekeepers at the state fair, and there will be equipment exhibits, demonstrations and recreation.

Western Missouri Beekeepers Assoc.
Kansas City, Mo., August 10

The August meeting will be held at the Swope Park shelter house No. 7 in Kansas City, Mo., from 12 noon until 7 P.M. on August 10. Several groups of beekeepers in and around Kansas City will meet together. There will be games and prizes for everyone. The Ladies' Auxiliary will serve ice cream. Bring your basket lunch and join us. Visitors are welcome.

Mrs. H. J. Schaffer, Sec'y

Westchester Co. Beekeepers Assoc.
Port Chester, N. Y., August 17

The Westchester County Beekeepers' Association will hold its regular monthly meeting at 2:30 P.M., August 17, at the home of A. F. Roth, 146 Oak St., Port Chester, N. Y. A good speaker is expected. Come and see some of Al's super honey hustlers. Anyone interested in bees is welcome. Refreshments will be served.

Carlton E. Slater, Publicity

Pennsylvania State Beekeepers' Association
49th Annual Beekeepers' Field Day and Picnic, August 23, 1952
State College, Penna.

Program 9:30 to 12:00

Registration—9:30 to 10:00.

Meeting called to order by the President, Paul S. Ziegler, Bethel, Pa.—10:00.

Group Singing, led by Mrs. Orpha Ziegler, Bethel, Pa.

Welcome—Dr. Lyman E. Jackson, Dean, School of Agriculture, Penn State College.

Inspection Program During This Summer—H. B. Kirk, Senior Entomologist, Harrisburg.

Honey House and Research—Prof. E. J. Anderson, Research in Apiculture, State College.

Why Use Honey—Harry W. Beaver, Troy, Pa.

The Future of Beekeeping—Prof. George H. Rea, Reynoldsville, Pa.

Preparing for Winter — W. W. Clarke, Jr., Extension Apiarist, State College.

Reading—Mrs. Donald M. Warner, Red Lion, Pa.

Greetings—R. B. Willson, New York City.

Note: It was suggested by a number of beekeepers that we keep the program short, and have it over by noon, so that the afternoon can be used for recreation, contests, games and tours. Let us make this an occasion for fellowship and outing for the whole family.

Basket Lunch 12:00

Lemonade and coffee will be served by the Centre County Beekeepers' Association. Tables will be provided in the park for your basket lunch. College ice cream will be on sale.

There will be a meeting of the Executive Committee during the lunch hour. A table will be reserved for this purpose.

The Secretary of the State Association will meet the secretaries of the County Association at 1:00.

Games and Contests 1:30

The games and contests will be in charge of Mr. Anderson. This is the high point in the program. Everyone can take part. Don't forget to bring your smoker and your favorite fuel. Ladies bring a hammer for the frame nailing contest!

Don't forget the Cooking Contest. Men also are invited to participate in this. Don't back out! Give it a try and show the lady cooks what you can do—you might win a prize.

Mrs. Howard Dennis of Allentown and Mrs. Charlotte B. Waldron of Malvern will arrange the products on the grounds. There will be three classes: Honey Cake, Honey Candy and Honey Cookies. Any person can enter all of the classes if they have some product for each class. There will be first, second and third prize for each class.

Come early enough to inspect the new extracting, heating, straining and bottling equipment in the Dairy Building. The picnic grounds are near the Dairy Building.

Lake Region Beekeepers' Assoc.
Perham, Minn., Sept. 9

The fall meeting of the association will be held in the City Hall in Perham, September 9. All beekeepers from adjoining counties are urged to attend. The association is buying packing paper collectively and it can be picked up at this fall meeting. Slides taken in Norway will be shown by an exchange student from that country who is studying beekeeping in the U. S.

L. W. Sundberg, Sec'y

GOOD QUEENS
Italian or Caucasian

Customer, if you want queens that will pay off in the future and produce bees that a man can handle with pleasure, send your requirements to me for I have them.

60c each.

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CUPRINOL® **STOPS ROT**

Applied by brush, spray or dip to the bare wood. Cuprinol will greatly lengthen the life of your hives by stopping rot. May be painted over. Does not offend bees. At hardware, paint and lumber dealers or direct. $4.70 gal.; $1.75 qt. Check or money order. No C.O.D.'s

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SPEARS' QUALITY BRED
ITALIAN QUEENS
QUEENS QUEENS QUEENS
Airmailed — 50c each.
Quality and Quantity unlimited.
Satisfaction assured, live delivery guaranteed.
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CARLOADS AND LESS THAN CARLOADS
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Answers . . .

conducted by

Frank E. McLaughlin

How may I distinguish between swarm cells and supersedure cells?

Stephen C. Bickel, Canada.

Supersedure queen cells are usually found in the middle of the comb either at the top, directly under the top bar, or anywhere from there on down two-thirds the depth of the comb. The bees usually try to place them in hidden places.

Swarm cells are nearly always found on the bottom of the comb, extending down. If the bottom of the comb is irregular, or the comb has holes in it, you will sometimes find swarm cells in these depressions. Of course the bees will try to hide the cells by covering them when you are looking at the combs. Bees will sometimes swarm on a supersedure cell. It does not always have to be a swarm cell.

Is there any way to mark a queen bee so that she may be found more easily?

Andrew Jugan, Pennsylvania

Queens are hard to find in the fall when they are smaller due to low egg production. They are also hard to locate at the peak of the working season when the colony is heavy with bees. Most equipment companies furnish a lacquer for marking queens. Regular finger nail polish of a red color will serve the same purpose. To apply the paint, catch the queen and hold her carefully between the thumb and forefinger. Place a small dot of the paint on her back. Hold her a moment for the paint to dry and release her on the comb. The slightest pressure while doing this may injure the queen, especially if she is laying heavily. Sometimes bees resent the queen being marked and kill her, but usually they don't mind at all.

How can I rid brood combs of pollen?

Mrs. D. W. Hough, Peru

Frames of pollen may be soaked in warm water, then run in a honey extractor as you would honey combs. The pollen should be thrown out of the combs. Usually, however, pollen-filled combs are simply cut out and new foundation installed in the frames.

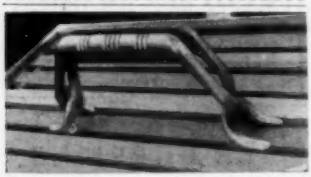
When and how should requeening be done?

J. F. Clarke, Iowa

The time of requeening is up to you; some beekeepers requeen in the spring and some in the fall. If you have a honeyflow of any consequence, you could requeen now. If not, it might be better to wait until spring during the early honeyflow, such as fruit bloom. Always requeen if possible when there is some nectar coming into the hive. The bees are much more likely to accept a queen.

To requeen, simply find the old queen and kill her and introduce the new queen. Push the frames to either side of the hive from the center. Slip the cage containing the new queen between the frames, candy side up (after removing the cardboard strip over the end of the candy hole) on an angle, leaving the top end of the cage even with the top of the frames. Push the frames back towards the center of the hive, to hold the cage in place. Close up the hive and wait a week. Then you can inspect the colony to see if the queen was released from the cage and accepted by the bees. On first inspection after requeening, be careful not to excite the bees.

Dadant's Starline Hybrids - Italians
Sold out for the season.
Thanks a lot.
S. J. HEAD, Crossett, Ark.
Reg. U.S. Pat. Off.



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This light modern tool is for easy handling and removal of frames from the bee hive. Orders promptly filled—Satisfaction guaranteed. $2.00 plus 30c postage fee.
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10% off May prices
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A CONSTANT MARKET FOR YOUR BEESWAX
DADANT'S, Hamilton, Illinois

High Quality Italian Queens
By Air Mail — 75c each
10 or more, 70c each.
Please refer to May Issue for Prices on Package Bees.
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HONEY PRODUCER AND PACKER'S SUPPLIES
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Box 7, 510 N. Cedar, Lansing, Michigan

ITALIAN BEES AND QUEENS

2-lb. pkg., each	$2.50
3-lb. pkg., each	3.50
4-lb. pkg., each	4.20
Nice Large Queens	
1-99	$0.55
100 up	.50

All queens are honeys for producing honey.
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low prices—save up to 28%. Free valuable premiums on orders.
We work your beeswax and purchase all grades of honey. Write today and save BIG money.
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(since 1858)

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Dadant's Starline Hybrids
They have been called "The Bees of the Future." They are of the Finest.
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1-24	$1.20
25-99	1.15
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Garon's 3-Banded Italians
Backed by over a quarter century of experience. Let us serve you at these reduced Summer prices.

1-24	70c
25-99	65c
100-499	60c

Queens clipped and painted and Air Mailed upon request.
GARON BEE CO. Donaldsonville, La., U.S.A.

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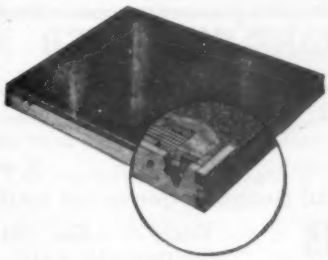

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"GULF BREEZE" ITALIAN QUEENS

The choice of many experiment stations, commercial and small operators. The result of 43 years of beekeeping behind our stock. Why not have a specialist produce them for you instead of someone with little experience?

Prices: 1-24 ..... 80c 25 up ..... 75c postpaid.

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As Soon as You Get That Honey Off, Requeen. It's Good Insurance for Wintering and Next Year's Crop

WE HAVE THE QUEENS

ITALIANS ITALIAN HYBRIDS CAUCASIANS

PRICES

1-24 ..... $ .75 100-499 ..... $ .65
25-99 ..... $ .70 Tested Queens ..... $1.50 each

Postpaid, Airmailed, and/or Clipped—No Extra Cost

The Stover Apiaries **Mayhew, Miss.**

CAUCASIANS UNLIMITED

Summer prices of queens effective June 1 for balance of the season:

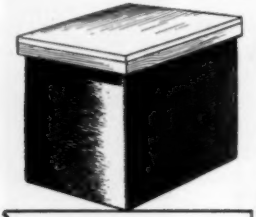
1 to 11 ..... $1.00 each 50 to 99 ..... $ .80 each
12 to 49 ..... .90 each 100 or more .... .75 each

Prices are by Air Mail postpaid. Queens are marked.

THOS. S. DAVIS Route 7 Box 3914 Sacramento, Calif.

Protect Your Bees Next Winter!

Use Bemis **Winter-Warm** Hive Covers!



Use new double-weight Bemis WINTER-WARM HIVE COVERS . . . the weatherproof, waterproof, durable sleeves that fit snugly over the hives and guard against killing wind and cold.

Easy to use . . . put on or remove in seconds; no nailing or tacking. Discard troublesome felt, etc.

Economical . . . cost per hive about same as retail price of a pound of honey. Three sizes —One Hive, Two Hives, Modified Dadant.

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"I gave WINTER-WARM HIVE COVERS a good test this year, covering some hives and not others. What a difference! I had 50 colonies scattered over one orchard. They came through 100%. Some were in low spots beside the river, others high on the hill where it was windy."

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A trial will convince you—A-B-J ads produce results

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HOLLOPETER'S QUEENS

Reared in the North from Northern stock full of vim, vigor, and vitality. Highest quality and best service during August and September buckwheat flow. Good time to requeen.

Prices—Young, mated and laying queens:

1- 9 ..... $1.00 ea. 50-99 ..... $ .75 ea.
10-24 ..... .90 ea. 100 up ..... .70 ea.
25-49 ..... .80 ea.

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BETTER BRED QUEENS
THREE BANDED ITALIANS

Use them for replacing failing queens, also requeening for swarm control, etc. You can't buy any better queens at any price. 60c each

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Special Size for Beekeepers
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The 1952 Support Program in a Nutshell

When is the program in effect? It is in effect now.

Who is eligible? Any producer of extracted honey.

When available? From April 1 through Oct. 31 for Florida, Georgia, So. Carolina, Alabama, Lousiana, Texas, New Mexico, Arizona and California. From July 1 through Dec. 31 in all other states.

What is the support level? For Montana, Wyoming, Colorado, New Mexico and all states west thereof: White or lighter table honey 11.5 cents; Darker than white table honey 11.0 cents; Non-table honey 9.5 cents. For all states east of Montana, Wyoming, Colorado, New Mexico: White or lighter table honey 12.25 cents; Darker than white table honey 11.75 cents; Non-table honey 10.25 cents.

What honey is eligible? Extracted honey of Grade C or better packed in clean, sound, transportable 60-pound containers.

What is approved storage? Structures considered by PMA officials to be safe, clean, dry, weatherproof, and capable of being locked.

What are the service charges? For farm storage loans—5 cents per 100 lbs. or a minimum charge of $3. For purchase agreements—2½ cents per 100 lbs. or a minimum charge of $1.50.

What do I do under a purchase-agreement plan? Go to your county committee office and sign Commodity Purchase Form 1—a simple agreement that CCC will buy your honey at the support level. The quantity you state on the form will be the maximum amount you may sell to CCC. If you are unable to sell your honey through normal channels of trade, you will have 30 days prior to March 31, 1953 to notify the county committee, and delivery will not be accepted before that date. Upon determination of the quantity, grade and color of honey delivered, you will receive a sight draft in payment from the county office. There are no requirements for storage but the full responsibility of delivering honey which meets grade and other specifications is yours.

What do I do under a loan program? Notify your county committee. A representative of the committee will arrange to approve your storage place, will determine the net weight of your honey, take samples for grade and color determination which you must supply free, and collect a fee for this grade and color determination. When the grade and color has been ascertained, a note and loan agreement on Commodity Loan Form A, secured by a chattel mortgage on Commodity Loan Form AA, is prepared and signed. If he so chooses, the producer then can go to a lending agency approved by CCC and borrow up to the face value, paying an interest rate of 3½ per cent per annum. The producer either is required to pay off his loan on or before maturity or deliver the honey in accordance with instructions of the county committee. He may sell a part of the honey under loan by making arrangements with the county committee. It is hoped, of course, that he will dispose of his crop through normal channels of trade and, if this occurs, he is

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Bogenschutz Honey Uncapper NOW

Uncaps up to nine frames a minute and even a child can run it.

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SERVICE ● QUALITY
LOWEST PRICES

When you order your supplies from us. Ready your apiary for comb honey production NOW. We can supply all your needs promptly.

THE MARSHFIELD MFG. CO.
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MARSHFIELD, WISCONSIN
Manufacturers of
Beekeepers' Supplies
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required to pay off his loan plus charges and accrued interest. Loans are due upon demand but the maturity date cannot be later than March 31, 1953.

When can I deliver honey to CCC? Under a purchase agreement, deliveries will not be accepted before March 31, 1953. Under a loan, upon request of the producer and approved by CCC, delivery can be made at a date earlier than March 31, 1953, but the loan settlement will be reduced by 1/20 cent per pound per month from the delivery date to and including March 31, 1953.

Who is responsible for proper storage and seeing that the honey doesn't spoil or deteriorate? Whether under purchase agreement or loan, the producer is solely responsible. If he delivers honey under loan, the producer must pay CCC for any deficiency in quantity, floral source, grade or color. If the honey is found to be ineligible, the producer must pay the cost of processing required to bring it up to eligibility. If the honey fails to meet floral source eligibility or cannot be processed to make it eligible under the program, the producer

(Please turn to page 352)

STARLINE QUEENS

	1-25	25-50	50-up
Italians	$ .75	$ .70	$ .65
Starlines	1.30	1.20	

Guaranteed Satisfaction. Postpaid — Clipped.

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Maximum production is most easily assured with superior bees and queens. That's one way we try to help you make money. Superior bees and queens is our motto at all times. We like to have 50 per cent deposit and balance before shipping date. We believe this is fair to all—as we like to plan and ship the day you want shipment. Price scale:

Queens, any number $1.00 — Tested Queens $2.50
2-lb. package and queen ..... $3.00 any number
3-lb. package and queen ..... 4.00 any number

THE VICTOR APIARIES Uvalde, Texas

ITALIAN QUEENS
AIRMAILED
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SUPERIOR HONEY COMPANY

FOUNDED FOR THE BEEKEEPING INDUSTRY OF THE WESTERN UNITED STATES.

A MARKETING OUTLET FOR ALL TYPES OF YOUR HONEY.

A MARKETING OUTLET FOR YOUR BEESWAX.

A SOURCE FOR YOUR SUPPLIES AND EQUIPMENT.

We are in business to serve you.

Visit our plants.

Ogden, Utah; Idaho Falls, Idaho; Denver, Colorado; Los Angeles, California; Phoenix, Arizona; and our Wood Goods Mill in Madera, California.

To Whom It May Concern:

Effective January 1, 1952, the partnership of

ROSSMAN & LONG

was dissolved with J. G. (Joe) Rossman buying the interest of E. W. (Emerson) Long of St. Paris, Ohio.

J. G. Rossman will continue to manage the Package and Queen business in Georgia.

There will be NO change in PERSONNEL or POLICY in dealing with the public.

Both Emerson and Joe feel this arrangement is better and terminate their very pleasant relations as partners with best wishes each for the other.

Queens available all fall. Regular or Kelleys Island 3-way Hybrid.

1 to 25 .... 85c each; 26 or more .... 75c each

No more packages this year, please.

"They Produce"

ROSSMAN APIARIES

Formerly Rossman & Long

P. O. Box 133 Moultrie, Ga.

JENSEN Says,—

Don't tolerate any old queens for what they "have been"; they never "snap back" for long once they show signs of exhaustion. **REQUEENING NOW** will pick up those laggard colonies and help make this fall crop of honey, and then the crop of young bees to form the winter cluster essential to good wintering.

And these queens will be good for all next season, that is, good ones like ours. We are continuing our queen-rearing and producing queens of highest quality for our customers and ourselves.

	Our Old Proven Line "Magnolia State" Italians	Dadant's "Starline" Improved Hybrids
1-24	$0.95	$1.20
25-99	.90	1.15
100-499	.85	1.10
1,000-up	.80	1.05

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Clipped and Marked Free.

Select Tested "Magnolia State" $1.50 each.

JENSEN'S APIARIES, MACON, MISS., U.S.A.

"The business QUALITY built."

SELL MORE HONEY . . .

with this "DRIPCUT" disposable cap.

Your package will take on a "new look" and perk up in sales with this new, convenient, genuine "dripcut" closure. It stops messy drippings and waste! AND, you'll be surprised at how little it costs to add this PLUS sales feature that will make customers select your brand off the shelves.

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$1.00 each, $90.00 per 100

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THE HEART OF THE COMB HONEY IS FOUNDATION —

The biting quality of the honey, that delicate center taste is foundation. It must become a part of the honey, so tender, a touch of the tongue will crumble it; yet be so strong, that bees work it out quickly and easily.

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QUEENS

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Steven C. Parks

The second death in 1952, not only within one beekeeping organization but within the same family, occurred on June 27 with the passing of Steven C. Parks. His father, Lewis W. Parks, passed away on January 21, 1952.

The death of "Steve" as he was familiarly called, came unexpectedly during the night, as he had retired in his usual good health, expecting to attend a golf tournament on the next day. He was 37 years old and leaves his wife Mary, two small sons, Steven and Lewis, his mother Mrs. L. W. Parks of Watertown, and one sister, Mrs. Catherine Baumgardner, of Ohio.

No one could have been better liked by his friends and associates; no one showed more promise to become a stalwart on all angles of the beekeeping industry and in his firm, the G. B. Lewis Company. He was their general sales manager, assistant general manager, director and secretary of the corporation. He was also a director of the American Honey Institute, an officer in his church, a member of the Watertown Airport Commission, a member of the Elks and of the Country Club.

Steve served during the war, advancing to the rank of Major in the air corps before severing his connection with the armed forces. He served both in this country and in the European theatre.

There has been a Parks in the Lewis organization for many years. Steve's grandfather's name, Charles Parks, appeared on the stationery of the Company many years ago. A search through some of our Lewis files disclosed that as early as 1879, G. B. Lewis had already taken his son-in-law into the business which was then to operate as "Lewis and Parks." This search also disclosed that at that time comb honey sections were selling at $2.35 per thousand and a one and one-half story hive at 65 cents. The elder Parks was an inventive genius and perfected the folding section as we have it today, as well as perfecting devices and machinery for their own work.

We all know of the efforts of the late Lewis W. Parks and his untiring work in making the American Honey Institute into a successful organization. Steve himself was of the same caliber and was already becoming indispensable to the industry as well as to the firm in which he was interested.

Words are futile but we assure his family and his organization not only that Steve will be missed but that he had among those who knew him either casually or closely, nothing but friends.

MACY ELECTRIC UNCAPPING KNIFE

No. 101 with Thermostat
No. 102 with Control Box
Price $16.80

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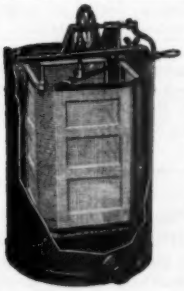
A Sample Copy
"Gleanings in Bee Culture"
LOOK IT OVER
YOU WILL LIKE IT
A. I. ROOT CO., Medina, Ohio



No. 14—4-frame double duty.

STANDARD
HONEY EXTRACTORS

Hand driven, smooth running. Gives rapid extraction with minimum of effort. Easy loading and unloading. Reel basket easy to remove. Adjustable flow honey gate. Extracts both frames and cappings. Easily cleaned. Weight 42 lbs. $28.15 FOB.

Handles 12 standard, shallow or half-depth frames. Heavy gauge galvanized, formed angle reel. Completes extraction in 5 to 8 minutes. Easily loaded and unloaded. Easily cleaned. Adjustable flow honey gate. Weight 125 lbs. $76.50 FOB factory.

STANDARD CHURN, INC.
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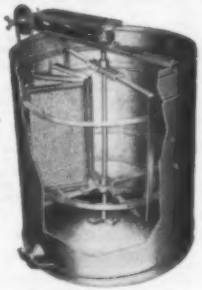

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STARLINE HYBRIDS
Package Bees
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Queens
C. G. WENNER
Glenn, California
Reg. U.S. Pat. Off.

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A wealth of up-to-the-minute expert advice on how to do wonders on a little land or a thousand acres . . . wonders with flowers, vegetables, fruits, landscaping, poultry, livestock, woodlands, fishponds, composting, soil improvement, etc. Just send name and address for this fascinating FREE catalog by return mail.
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Lot 1-5, $1.35; 5-15, $1.30; 15-25, $1.20; 25-100, $1.15; 100 up, $1.05.
Select tested $5.00 (no discount)
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QUEENS
Package Bees
M. C. WEST
Box 295
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THRIFTY QUEENS
Three-banded Italians only
Lots of 100, $55.00. Smaller lots 65c each.
REMEMBER—Thrifty Bees are Guaranteed to please.
W. J. Forehand & Sons
Fort Deposit, Ala.
Breeders Since 1892.

ITALIAN
PACKAGE BEES & QUEENS
for 1952
We are now booking orders for Spring Delivery.
GIRARDEAU APIARIES
Tifton, Georgia

CANADIAN BEE JOURNAL
Canadian beekeepers have much in common with their neighbors in the U. S. If you are interested in bee activities "North of the Border," send us your subscription NOW. Subscription price, $1.75 per year in U. S. A.
Canadian Bee Journal
Streetsville, Ontario, Canada

A CONSTANT MARKET FOR YOUR BEESWAX
DADANT'S, Hamilton, Illinois

New Utah Publications . . .

Utah is actively continuing its extension program to show their growers how to produce more alfalfa seed per acre through preservation of wild pollinating insects and through use of honey-bee colonies. This year they have issued three one-page and one eight-page circular which we list below.

Growing Alfalfa Seed without Destroying Pollinators, Extension Circular 155, by George F. Knowlton. **Raising Bees,** Extension Circular 157, by George F. Knowlton and William P. Nye. **Wild Bees for Pollination of the Alfalfa Seed Crop in Utah,** Fact Sheet No. 8, by George E. Bohart and George F. Knowlton. **Recommendations for Controlling Insects in Utah,** (8 pages) Extension Circular 167, by F. V. Lieberman, G. F. Knowlton, S. J. Snow and C. J. Sorenson.

These well-illustrated and highly informative publications are the result of cooperative work between Utah State Agricultural College and the Bureau of Entomology and Plant Quarantine, Agricultural Research Administration, U. S. D. A. Alfalfa seed growers and beekeeper-pollinators will find them useful and valuable.

Clifford F. Muth . . .

As we go to press we learn of the death of Clifford F. Muth, president of the Fred W. Muth Co. which occurred on July 18. His father, Fred W. Muth, passed away in 1949. The Muth family has long been identified with the beekeeping industry. More in August issue.

Support Program—

(Continued from page 349)

will be paid only the market value as determined by CCC and approved by the Fruit & Vegetable Branch.

Warehouse loans and many other features of the 1952 Honey Price Support Bulletin 1 and Amendment 1 are not included in this brief summary of the program. Producers are advised to contact their local county committee offices, state or regional Production and Marketing Administration offices, or write to Mr. E. M. Graham, Chief, Special Commodities Section, Fruit and Vegetable Branch, P.M.A., U.S.D.A., Washington 25, D.C., for further information.

Frank C. Alexander . . .

The name of Alexander brings to mind the 700 colony apiary at Delanson, N. Y., operated by the late E. W. Alexander. Mr. Walter Severson, retired as manager of the Albany branch of the Lewis Company, reports that Frank C. Alexander, son of E. W., died in nearby Esperance, age 76.

The son still kept bees, though the days of the abundance of clover, and particularly buckwheat, precluded any return to the large outfits of his father.

Beekeeping and Agricultural Sprays . . .

The above is the title of a 12-page bulletin by Beowulf A. Cooper, B. Sc., A. R. C. S., F. R. E. S., reprinted from the "Yearbook of the Lincolnshire Beekeepers' Association, 1950-51." This publication is available from T. F. Theaker, Hon. Secretary, L. B. K. A., Leadenham, Lincs., England, at a price of 25 cents.

The bulletin presents a complete discussion of the effect of insecticidal dusts and sprays on honey bees, including the weed killers. It discusses preventive measures, choice of harmless materials, and correct timing of application for those administering the insecticides. For the beekeeper, it discusses training bees to avoid sprayed crops, provision of drinking water, confining the bees when this becomes necessary, moving hives from the danger area, and treatment of injured colonies.

Stressing cooperation and education as the best approach to the insecticide problem, Cooper discusses systems of notification of impending spraying, what the beekeeper can do to educate the users of insecticides, how best to make a survey of spray damage, and legislation controls.

Those confronted with damage from applications of insecticides and weed killers, and those applying such materials, will find this publication informative and worthwhile.

New Spraying Law In New Zealand . . .

Under a new law, an orchardist in New Zealand has been heavily fined for spraying his fruit trees during bloom, on account of the subsequent loss of bees.

Meetings . . .

Kansas State Beekeepers Assoc.
Fifty-first Annual Meeting
Sunday, September 7, 1952
High School Auditorium
Altoona, Kansas
M. C. Mitchell, President K.S.B.A., Presiding

9:00 a.m. Committee Meetings. Legislative committee, A. V. Small, Augusta, Chairman; Marketing committee, V. H. Adee, Haddam, Chairman; Nominating committee, Leroy Churchman, Wichita, Chairman; Educational committee, Roger C. Smith, Manhattan, Chairman.

11:00 a.m. The Significance of Hybrid Bees, G. H. Cale, Editor, American Bee Journal, Hamilton, Ill.

11:30 a.m. Discussion.

Noon, Basket Lunch.

1:00 p.m. The 1952 Honey Price Support Program, Paul E. Phillips, Food Distribution Branch P.M.A., Dallas, Texas.

1:30 p.m. Discussion.

2:00 p.m. Alfalfa Pollination in Central and Western Kansas. W. W. Franklin, Ft. Hays Branch Experiment Station, Hays, Kansas.

2:20 p.m. Discussion.

2:30 p.m. Kansas Beekeepers and the American Beekeeping Federation. Glenn Jones, Secretary of The American Beekeeping Federation, Atlantic, Iowa.

2:50 p.m. Discussion.

3:00 p. m. Business Meeting. Reports of Committees.

REQUEEN WITH BARGER'S
Northern Italian Queens
Large deep thorax, long-legged beauties.
Untested—1-24 ..... $1.00
24 up ..... .75
Select tested in large cages $2.00
Clipped, Air Mailed, Painted
BARGER APIARIES, Carey, O.

PACKAGE BEES FOR 1952

Truck loads a specialty. Nuclei made to order. Italian queens, any number at any time.

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Route No. 2 — Box 207
Live Oak, Calif. — Phone 5584

FLORIDA BEE & HONEY CO.
2649 Hanford Road **Orlando, Florida**
TWO HIGH PRODUCING STRAINS—
Dadant's Starline Hybrids and our Regular Stock

Reg. U.S. Pat. Off.	— QUEENS — Regular	Starline	
1-24	$1.00	$1.30	No packages furnished after May 15.
25-99	.85	1.20	Queens, both Starline and regular stock, available until October 15.
100-999	.75	1.10	

York's Quality Bred
YOUNG ITALIAN QUEENS

Quantity	Price
1-24	$1.00 each
25-99	.85 each
100 up	.75 each

The Strain Preferred by Leading Honey Producers

YORK BEE COMPANY **Jesup, Ga., U.S.A.**
(The Universal Apiaries)

STARLINE QUEENS AND PACKAGE BEES

Packages headed by Dadant's Starline Queens will produce more honey easier with less stinging and are resistant to American foulbrood. These are facts reported to us by users of this stock.

Reg. U.S. Pat. Off. Quantity	Queens	2 lbs. w/q	3 lbs. w/q	
1-24	$1.35	$3.50	$4.50	extra bees $1.00 per lb.
25-99	1.25	3.25	4.25	For our standard 3-banded Italian stock deduct 25 cents per item.
100-up	1.15	3.00	4.00	

WICHT APIARIES **406 Miller St., Hattiesburg, Miss.**

LADYLIKE

CAUCASIAN bees in our testing apiaries in a North Central State more than doubled that state's average per colony honey crop in 1951. Our breeding queens for this season were selected for disease resistance, honey production, and gentleness. Their daughters will produce for you if properly handled.

Select Untested Queens:

1- 9 each	$1.10	25-50 each	$ .90
10-25 each	1.00	50 or more	.75

Queens marked and clipped free on request.

Please print name and address. All queens shipped air mail.

CAUCASIAN APIARIES **Castleberry, Ala.**

Trade Mk. Reg. U. S. Pat. Off.

KELLEY—"The Bee Man"

QUEENS

IMPROVED KELLEYS ISLAND HYBRID STOCK

While these queens and their bees appear to be pure bred 3-banded Italians and are very gentle, they are exceptionally heavy layers and have other desired characteristics.

Each by Prepaid Air Mail from Paducah **75c**

Lots of 25 and more, 65c each.

THE WALTER T. KELLEY CO. Box 210, Paducah, Ky.

Renew Your Subscription Now To A-B-J

Pollination In New Jersey

(Continued from page 324)

of lima beans. This is especially important since about one-half of the frozen limas sold in eastern markets are grown and processed in this small state.

Although the apple acreage is small, the closeness to markets has brought adequate returns to the apple grower. These men have all been pollination conscious since the twenties when the N. J. Experiment Station put out its classic, "Pollination Studies," written by Ray Hutson. These experiments by Mr. Hutson are still gospel after thirty years, and the bulletin is still in great demand.

Wartime prosperity and government buying caused the planting of additional apple acreage, and if the dollar remains in its current liquid state until these trees begin to bear, probably another thousand colonies will be necessary.

An adequate demand for bees here and the recent publicity will make 1952 the best pollination year for the eastern coast area. Beekeepers who supply pollination services in New Jersey have long been the more fortunate than those beekeepers in other states. This has been largely due to the work of the N. J. Experiment Station and also the efforts of one man, the late Richard D. Barclay, who offered the first commercial pollination service in the East.

Besides his bee work, Mr. Barclay labored full time to make the pollination service the respected business that it is today. His integrity made his competitors also offer quality colonies and fair dealings. Though he is no longer on the scene, he lives in the memory of those farmers seeking pollination services.

At the present time, with retail honey moving slowly, many beekeepers are moving into pollination work. They have little knowledge of this specialized service. They see only the eight to ten dollars offered for their colonies. They show ignorance in their approach. Instead of invading the new and prospective territories, their idea of getting business is to offer to undersell. The same thing ruined the honey markets not too long ago.

However, at the present time this is not too important, since the grower who is getting good service, is afraid to trust his crop to a man who puts out bees at a price lower than men legitimately engaged in the business. Sound business sense, when you stop to analyze. He is buying an insurance policy for $8.50 (one colony rented per acre) to assure his making a net return of five hundred to one thousand dollars.

Those growers who do adopt the pennywise system are probaby the bad risks anyway and sometimes the pollen culturists are better off without them. In spite of the "fly-by-night," prospects are good. If the young man who anticipates entering beekeeping will take the time to learn the business and learn some fundamentals of good business practice, pollination offers beekeeping's best future at present.

New Jersey

Apt Quotations from The British Bee Press . . .

"A winter cannot be too cold for bees if they are kept dry—it is only damp cold which hurts them." Quoted from W. C. Cotton's "My Bee Book" (1842) by Dan Bone in "Bee Craft."

THE RICH HONEY FARMS

Jeanerette, La.

Dadant's Starline Hybrids — Rich's Leather Italians

Reg. U.S. Pat. Off.

For pleasure or profit we have the two most outstanding strains available.

Only young laying queens that have produced a good compact brood pattern are caged for shipment.

These strains are under constant test in our honey production yards along with other leading breeds.

We guarantee that you will be more than pleased with their performance.

Live delivery guaranteed, clipped and marked with a white dot for your convenience at no extra cost.

Why not requeen this summer and help prevent swarming next spring?

Dadant's Starlines		Rich's Leather Italians	
1-24	$1.30	1-24	90c
25-99	1.20	25-99	80c
100 Up	1.10	100 Up	75c

HONEY WANTED

Cut Comb and Extracted

Advise what you have

T. W. BURLESON & SON

WAXAHACHIE, TEXAS

Palmetto Quality Queens

On same old basis, Quality, Service, Satisfaction.

Three-banded Italians only.

June Prices

1 to 5 ..... 75c each

6 to 10 ..... 70c each

More than 10 ..... 65c each

No disease.

C. G. ELLISON & SONS

Belton, S. C.

ITALIAN QUEENS

Pure mating guaranteed

$1.00 each

W. E. PLANT

Hattiesburg, Rt. 2, Miss.

Renew Your Subscription

DO YOU KNOW That Radial Extractors of small diameter will not get all the honey? There must be distance from the Reel Axis to get the proper throw. Radial or Vertical extracting is a slower process than Basket or Horizontal extracting. The only advantage in Radials is in loading larger numbers of combs at a time, with less time consumed in starting and stopping. Our Universal Extractor will load 4 deep or 8 shallow 6¼" frames at a time, hand or motive power and will extract faster and better, than small size Radials.

A. G. WOODMAN CO. **Grand Rapids 4, Mich., U.S.A.**

Crop and Market

by M. G. Dadant

The Honey Crop

A pretty good idea can be gleaned from reports coming in on the 1952 honey crop. The eastern seaboard seems to have had an average crop. Early yields were quite satisfactory. The sourwood proved a disappointment in the lower levels, although higher up, above the 3,000 foot level, sourwood did extremely well this year. Georgia is about average. Florida if anything is better than last year which also was a good crop. Extending across the southern belt of states, the crop seems about average, but as you approach Texas we have the difficulties of drought. We find earlier prospects throughout the area of Oklahoma, Arkansas, Texas, and extending into Kansas and New Mexico were very good. However, drought has very greatly interfered, and as a consequence, the crop in these areas will be considerably less than it was a year ago.

The New England states seem to be just a bit better off than they were a year ago, and New York which apparently was doomed to have a very short crop this year has come up with later better reports, and conditions now look much more favorable. There is, however, a strip extending from West Virginia through Pennsylvania, Ohio and Indiana which has suffered, first by cool wet weather and now by drought, so that the results are anything but satisfactory. Some indication of this is also seen in Tennessee and southern Illinois. Michigan apparently will be about average. Wisconsin and Minnesota, as well as northern Illinois and most of Iowa and extending into North Dakota and parts of South Dakota, seem to be having better than the 1951 crop and in some cases it is almost a "bumper" one. There are some northern areas in Missouri which are also good.

While there was an early drought in the Red River Valley, this has been overcome and conditions later proved very satisfactory.

The Black Hills section of South Dakota extending into northern Montana as well as into most of western Nebraska, Kansas and over into Wyoming seems to have had unfavorable circumstances, and probably not as satisfactory a crop as had been anticipated. Even in southern Montana where conditions are nearer normal, it probably will not approach the 1951 crop. The intermountain territory is still indecisive although undoubtedly average honeyflows have been on and the bees have done very well, handicapped somewhat by cool unfavorable weather in the early build-up. On the Pacific Coast, Washington and Oregon have had very wet weather, but conditions are about normal now. California had a very fine orange crop followed by a two weeks' period of cold, cloudy weather, which made a real reduction in the crop. However, the high amount of rainfall has meant excellent possibilities in the moving of bees, and sage and other desert flora have yielded extremely well during 1952. California should have far above last year in honeyflow which was in itself enough to give California first place. Arizona is only average.

In Canada, the western provinces seem about normal whereas Ontario and Quebec are complaining of drought and the possibility of a short crop.

Crop Possibilities

Rain throughout most of the northern areas has been interspersed with enough sunshine so that it looks like perhaps the earlier good crops would be carried over until fall and that there might be enough fall weeds for a honeyflow. This is handicapped considerably by the fact that in many sections, especially Indiana and Ohio, heavy spraying for weeds has been carried out which might hurt the heartsease flow at least.

Farther south it is questionable whether later flows will materialize to the point of adding any great amount to the total. The intermountain territory will, of course, have a continuation of the alfalfa flows after each cutting, and should range well for the long flow. California continues to report good crops in the arid areas, and cotton is still to be dealt with. The amount of this fiber has grown to great proportions in California and should mean a great deal to the migrating beekeepers there.

Cotton in the southern areas on the other hand is about all these southern beekeepers have to plan for during 1952. The drought has seriously interfered, but there are still possibilities.

On the whole, the possibilities are not any better than a year ago, while the total crop so far might indicate a somewhat larger total than last year, due to the larger crops in the Red River and Missouri Valley areas, combined with the heavier California crop.

Honey Demand

It is too early for any suggestions on the honey demand. It seems, however, the demand is sufficient in the southern areas so that those packers who are confronted with a short crop are already scrambling for what crop is available and reaching out into the northern areas, particularly for bulk comb to pack with the liquid honey. We learn of a standard price of 20 cents for bulk comb and 12 cents for good white honey for packing purposes. We also learn of a bid of 12½ cents on a carload of old Montana honey delivered in Idaho.

Prices for Honey

As mentioned above, the support prices seem to pretty much rule; namely, 11 to 12½ cents for white and 1 and 2 cents less for amber honey. There is no sign yet of any packer going out actively trying to buy honey under support prices, but undoubtedly sacrifice lots will be encountered where the producer is not properly informed or where he prefers to sell promptly for cash instead of mixing up in a storage and loan program.

In the Canadian provinces, the balance of the old crop of honey is reducing to very favorable proportions, and no doubt prices will hold, or perhaps advance slightly in sympathy with the prices south of the border.

There still seems to be a tendency for large distributors, like chain stores, to try to hold down prices to last year's level.

Honey Wanted—Cars and less than car. Top Prices.
C. W. Aeppler Co., Oconomowoc, Wis.

The Market Place . . .

BEES AND QUEENS

SHORT'S QUEENS ARE GOOD QUEENS. Try them and you will find their colonies tops in production, gentleness, and free from diseases. Three banded Italians only. Used by leading honey producers for more than 30 years. Requeen now for maximum production next year. $1.00 each; 10, $9.00; 25, $20.00. Prompt shipment. Postpaid. H. C. Short, Fitzpatrick, Ala.

YELLOW ITALIANS—Real honey producers, service guaranteed. 3 lbs. with queen $4.50. Queens 80c; 50 up, 75c. Air mail. O. E. Brown, Rt. 1, Asheboro, North Carolina.

BRIGHT 3-BAND ITALIAN queens 75c—Bright or dark. Luther Pickett, Owner Orange Bee Co., Efland, N. C.

CAUCASIAN QUEENS — Untested, laying, $1.00 each. Eppling's Apiaries, Covington, Virginia.

YANCEY HUSTLER QUEENS — Three-band Italians, bred for business. $1.00 each; $10.00 per dozen. All guaranteed. Caney Valley Apiaries, Bay City, Texas.

QUEENS — Reliable strain. $1.00 each. Dalice E. Crawford, Rt. 1, Haw River, N. C.

CAUCASIAN BEES AND QUEENS—Extra good workers and very gentle. 2-lb. with queen $3.00; 3 lb. with queen $4.00. Select untested queens, 1 to 25, $1.00; 25 to 100, 90c; 100 up, 80c each. All orders given special attention. Black River Apiaries, Elliott Curtis, Mgr., Currie, North Carolina.

THREE BANDED ITALIAN bees and queens, best of quality. 2-lb. with queen $3.00; 3 lb. with queen $4.00. Select untested queens, 1 to 25, $1.00; 25 to 100, 90c; 100 up, 80c. Write for prices on larger orders. Phone 4703. Alamance Bee Company, Geo. E. Curtis, Mgr., Graham, North Carolina.

GOLDEN ITALIAN BEES and QUEENS very yellow and gentle to work with. 2 lb. with queen $3.00; 3 lb. with queen, $4.00. Select untested queens, 1 to 25, $1.00; 25 to 100, 90c; 100 up, 80c. Satisfaction guaranteed. Phone 7731. Carolina Bee Farm, W. O. Curtis, Mgr., Graham, North Carolina.

CAUCASIAN QUEENS — Young, laying. Personally raised. $1.00 each. Fred Breck, McDonald, Tenn.

SELECTED ITALIAN QUEENS 75c each, Caucasian 90c, Carniolans $1.00 each. All queens shipped by Air Mail and guaranteed to please. Walter D. Leverette, P. O. Box 384, Ft. Pierce, Florida.

CAUCASIAN QUEENS—One, 75c; twenty-five or more, 65c each. Tillery Brothers, Greenville, Ala.

FOR SALE

FOR SALE—Equipment for 500 colonies of bees, radial extractor, tanks, bee house and locations. Must sell owing to age. Write H. B. Keller, Underwood, Iowa.

50 colonies—40 Modified Dadant; ten 10-frame. Equipment and supers. State inspected. New disease resistant queens. Reason for sale—army. Don Morrill, 2114 W. 112th St., Chicago, Ill.

FOR SALE — 600 10-frame factory made extracting supers and brood chambers with drawn comb. Hive stands, bottom boards, covers. No disease. Frank Kearns, Austin, Minn.

FOR SALE—New heart cypress 10-frame bottom boards K.D. 10 or more, $1.00 each; 50 or more, 90c each; 100 or more, 85c each. 1 nailed up sample, postpaid $1.25. Fred L. Poole, Rt. 2, Bx. 67, Elizabethtown, N. C.

Copy for this department must reach us not later than the tenth of each month preceding date of issue. If intended for classified department it should be so stated when advertisement is sent.

Rate of Classified advertising—13 cents for each word, letter, figure or initial, including the name and address. Minimum ad, ten words.

As a measure of precaution to our readers we require reference of all new advertisers. To save time, please send the name of your bank and other references with your copy.

Advertisers offering used equipment or bees on comb must guarantee them free from disease or certificate of inspection from authorized inspector. The conditions should be stated to insure that buyer is fully informed.

150 colonies including all honey if bought before extracted. Address Box 78, Cambridge, Idaho.

FOR SALE—Entire 1500 colony outfit in Montana. Will sell all or part of them, with or without bees, with or without honey house, with or without home. Here is an opportunity to get into business. You name your own price! Write Box 11, c/o American Bee Journal.

90 5-gal. used honey cans, 37½ cents each. 90-gal. honey tank, $20.00. F. A. Storz, St. Mary's, Iowa.

Woodman 4-frame reversible extractor $35.00. 4-frame non-reversible with power drive $25.00. Both o.k. every way. John Blietz, Monona, Iowa.

500 3-story 10-frame colonies near Sacramento, Calif. Excellent opportunity for young man interested in early queens and packages. Good orchard and pollination fees. Excellent late fall honey locations. Box 17, c/o American Bee Journal.

FOR SALE—1952 models Electro-Flo filling machines $285.00 f.o.b. Hancock Honey House, Hancock, Iowa.

HONEY and BEESWAX WANTED

CASH PAID for honey in all grades. Submit samples. Schultz Honey Farms, Ripon, Wisconsin.

CUT COMB, CHUNK, Clover preferred. Truck lots or less. Cash on delivery. Lose Brothers, Inc., 204-206 E. Jefferson, Louisville, Ky.

WANTED — Extracted honey, white or light amber, in 60's. State price in first letter. Ed. Heidt, 1004 W. Washington St., Bloomington, Illinois.

WRITE FOR SHIPPING TAGS and current quotations on rendered beeswax. Any amount from one pound up bought. If you have 25 pounds or more, save 25% by letting us work it into foundation for you. Walter T. Kelley Co., Paducah, Kentucky.

HONEY WANTED—All grades and varieties. Highest cash prices paid. Mail samples. State quantity. HAMILTON & COMPANY, 1360 Produce Street, Los Angeles, California.

WANTED—All grades comb and extracted honey, large or small amounts. Quote price in first letter. Mail sample. King Honey Co., 4308-10-12 E. Truman Road, Kansas City, Mo.

CARLOADS or less of honey and wax. Send sample and price. Alexander Co., 819 Reynolds, Toledo, Ohio.

WANTED—Honey, amber or white. Mail samples and state quantity. No buckwheat. Holland Honey Cake Co., Holland, Mich.

COMB and EXTRACTED HONEY wanted. Truck or carload lots. Contact Victor Honey Farms, Josephine, Texas.

WHITE GRADES 11.4 and cans back, delivered. Mail samples. Cole Honey Co., 4460 Piedmont Ave., Oakland, Calif.

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The Present Status of the Dangers of Pesticides

(Continued from page 323)

pests will continue with increasing intensity. These poisons will kill off the beneficial insects as well as the destructive ones. As the solitary bees are gradually eliminated, the importance of the beekeeping industry to agriculture will be enhanced, and, as a consequence, the welfare of the industry will have to be considered in all pesticide programs.

Which chemicals are highly toxic to bees and which ones can be used with comparative safety? Most of the newer chemicals are so complex in their chemical structure that trade names, initials, or numbers are used frequently in their identification.

Bailey and Smith[1] divide agricultural chemicals which are applied as sprays or dusts under the following headings, the number of different compounds under each heading being indicated here in parentheses: **Fungicides** — sulphur (3), copper (15), mercury (10), dithiocarbamate (6), dinitro (3), zinc (6), quinone (4), miscellaneous (7); **Insecticides** —arsenic (9), fluorine (4), plant products (8), chlorinated hydrocarbons (22), oils (3), organic phosphates (4), sulphur (8), dinitro (4), miscellaneous (14); **Herbicides**—selective contact (13), hormonelike (8), general contact (9), soil sterilants (11), water herbicides (2), soil fumigants (11); **Plant Hormones** (11); **Nutrient sprays** (7); **Defoliants** (2); **Blossom thinning sprays** (7). Total listed, 211 compounds, and many more have been formulated since the list was assembled last year. Needless to say, all of these compounds have not been tested as to their toxicity to bees, but the complexity of the problem facing the research worker or the beekeeper is made more obvious by this listing.

Calcium arsenate has been replaced largely by DDT, DDD, and toxaphene with a material reduction in the loss of colonies. Some arsenicals are still used on fruit trees and on field crops but can be replaced by more effective chemicals which are less injurious to beneficial insects. Methoxychlor can be considered as a safe insecticide, but certain other chlorinated hydrocarbons such as benzene hexachloride, chlordane, lindane, aldrin, and dieldrin are highly toxic to bees on contact and as stomach poisons. Chlordane is an effectively fumigant and has long residual action. (It should never be applied for ant control in or near a comb storage room.)

The organic phosphates, TEPP, parathion, metacide, and EPN, are some of our most toxic poisons to bees, and beekeeping cannot survive in areas where they are used freely. Sulphur and sulphur compounds are generally safe under field conditions, including aramite, phenothiazine and sulphenone. Dinitro compounds, as used in controlling mites on legumes or for fruit thinning, are not too destructive to pollinators. In the orchards the sprayed blossoms soon become unattractive to bees.

The herbicides remove a lot of bee pasture but in general are not too injurious to the bees. The use of 2,4-D has caused greater control to be exercised in the use of pesticides than all of the years of agitation for supervised control on the part of the beekeeping industry and in this way has benefited the industry.

Bordeaux mixture is not injurious to bees in a limiting way, but some of the newer copper fungicides have caused serious losses when applied to fruit trees in bloom or when the sprays fell on cover crops on which the bees were working.

No effective repellents have been found to use with harmful sprays or dusts to prevent injury to bees, and none of the newer pesticides have sufficient repellency to prevent injury to bees working in sprayed or dusted foliage. Dusts are more injurious, on the whole, than sprays and are more difficult to confine to the crops or fields treated.

The value of honey bees to agriculture is being realized, and the industry can profit more by demonstrating this fact than by militating against the use of pesticides.

1. Handbook of Agricultural Pest Control, Industry Pub. Inc., N. Y.

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Both Sides Need to Know Pollination Details

(Continued from page 322)

It has been said that fruit production, seed production or any crop production that involves pollination must be considered as a three-legged stool, the legs of the stool being pollination by bees, pollination requirements of the crop, and crop production practices such as fertilizers, spraying to control injurious insects, and so forth.

Beekeepers are sometimes inclined to lay stress on the role of the bees in pollination, as if it were the only factor in the success or failure of the seed or fruit crop. This is unwise because the bees are only one factor, and in any particular region or with any particular crop it may happen that pollination is not the only limiting crop yield factor.

With fruit and seed crops, weather may limit the crop yields drastically. Some beekeepers working with alfalfa seed growers have found to their sorrow that excessive rain or drought or early frosts may limit the crop yield even though excellent pollination service was supplied.

For top yields of any crop there must be a normal plant, neither too vigorous nor lacking in vigor. The plants must be properly spaced (particularly important with fruit crops) must be supplied with the proper amounts of fertilizer at the correct times and all other cultural practices must be applied to the crop in the correct fashion.

Beekeepers worry greatly about poisonous sprays applied to crops which are attractive to bees. Rightly so, because they have had serious losses in the past. There is no simple solution to this problem. The various state experiment stations and the United States Department of Agriculture are working constantly on the two problems of pollination and the control of injurious insects. Growers are going to use the sprays that are necessary to control injurious insects. The important point is to get them to use the material that is least toxic to bees and still gives control. Every beekeepr should familiarize himself with the latest spray recommendations for his locality and the reasons for them and be sure that the cooperating farmers are also aware of the recommendations in detail.

The quantity of seed in the bag or fruit in the box is the final proof of the real value of pollination. Beekeepers would be well advised to keep out of orchards or seed production fields where the grower refuses to cooperate. Likewise, growers should pass up beekeepers who do not furnish colonies that are up to the strength required to perform satisfactory pollination service.

Working together, the farmer and the beekeeper can produce maximum yields. Working independently, one or both will suffer financially. Bees are often the key to prosperity, but other crop production factors are also important.

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